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REMOVAL ACTION REPORT
FOR
SAUGET AREA 1: SITE G
SAUGET, ST. CLAIR COUNTY, ILLINOIS
TDD: T05-9405-006
PAN: EIL0836SAA

ecology and environment, inc.
International Specialists in the Environment

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FOR
SAUGET AREA 1: SITE G
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TDD: T05-9405-006
PAN: EIL0836SAA

AUGUST 19, 1994

Prepared by: Steven J. Shane Date: 8/19/94

Reviewed by: John Sherrard by Patrick M Zelly Date: 8/19/94

Approved by: Patrick M Zelly Date: 8/19/94

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International Specialists in the Environment

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1.0 INTRODUCTION

The Ecology and Environment, Inc. (E & E) Technical Assistance Team (TAT) was tasked by the United States Environmental Protection Agency (U.S. EPA) under Technical Directive Document (TDD) number T05-9405-006 to conduct a site assessment (SA) for the Sauget Area 1: Site G, St. Clair County, Illinois. As requested by the U.S. EPA On-Scene Coordinator (OSC), the TAT has prepared this site assessment report to summarize SA activities. The SA was performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and 40 Code of Federal Regulations (CFR), Section 300.415, Paragraph (b) (2) to evaluate on-site conditions and potential threats to human health and the environment.

2.0 SITE BACKGROUND

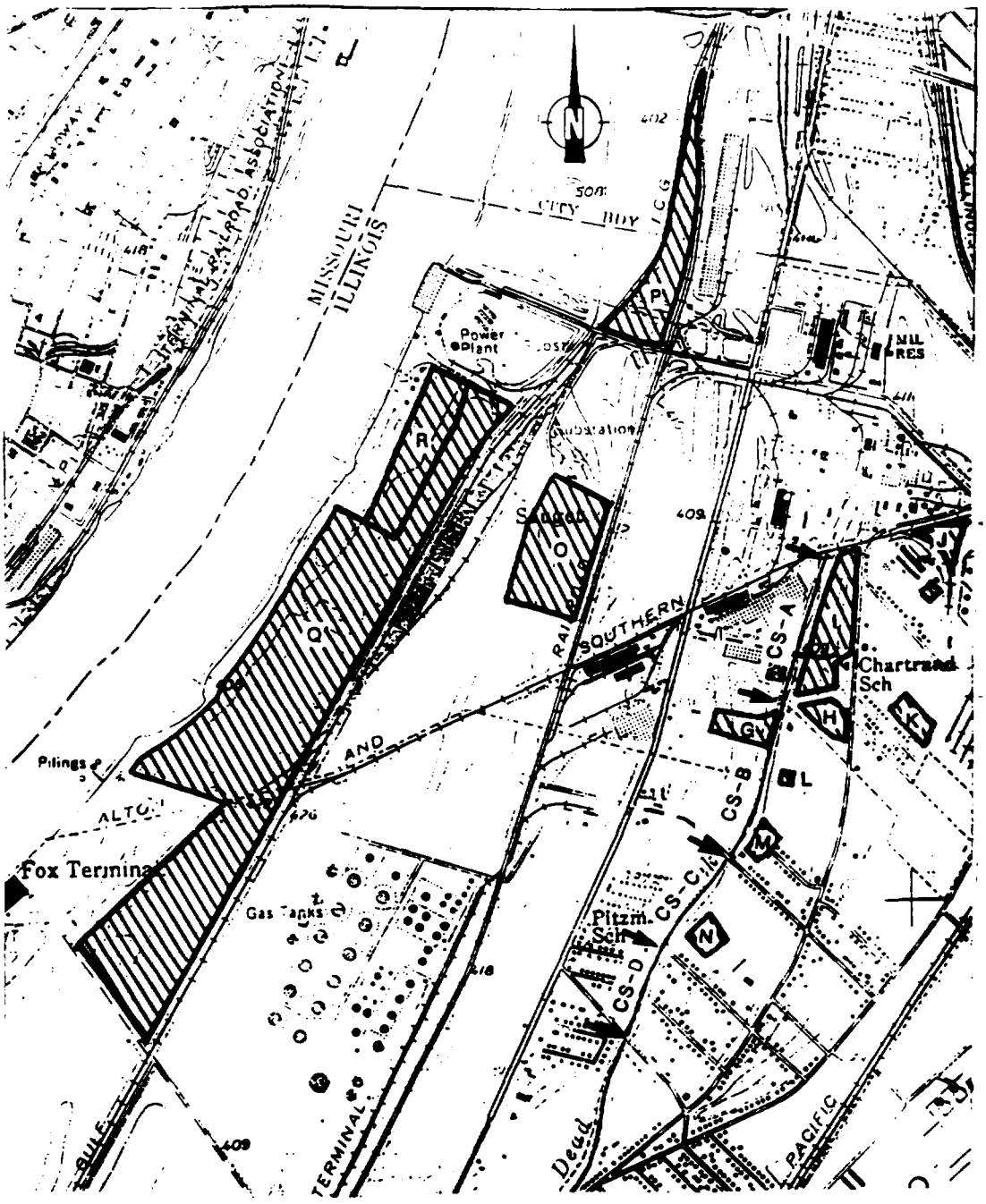
2.1 Site Description

Site background information was obtained from the site file, including the IEPA Extended Site Inspection (ESI) Report. The focus of this SA report will be Site G of Sauget Area 1, which, along with Sauget Area 2, is part of the Dead Creek Project (DCP), or Sauget Sites (SS). The Sauget Sites are located in west-central St. Clair County, Illinois, directly across the Mississippi River from St. Louis, Missouri (see Figure 1 - Site Location Map). The DCP sites consist of a number of former municipal and industrial waste landfills; surface impoundments or lagoons; surface disposal areas; past excavations thought to be filled or partially filled with unknown wastes; and an areal drainage flowpath known as Dead Creek, which is closed off from surface water intake at Queeny Avenue.

According to site file information, Site G is a former subsurface/surface disposal area which occupies approximately 4.5 acres. The site is located in Sauget, and is bordered by Queeny Avenue on the north; Dead Creek on the east; a cultivated field on the south; and Wiese Engineering Company property on the west (see Figure 2 - Site Features Map). Waste disposal activity occurred between 1950 and 1985.

The primary drinking water source for nearby residences is from a water intake along the Mississippi River, approximately 3 miles north of the DCP sites. At least 50 residents in the area obtain drinking water from private wells, based on Illinois Department of Public Health (IDPH) information. The nearest drinking water well is located on Judith Lane, approximately 1/4 mile south and downgradient of Site G. Over 20 industrial wells are located within a 3-mile radius, some downgradient from the site.

The land surrounding the site is used for a number of purposes. Industrial, commercial, and municipal buildings are nearby, as is



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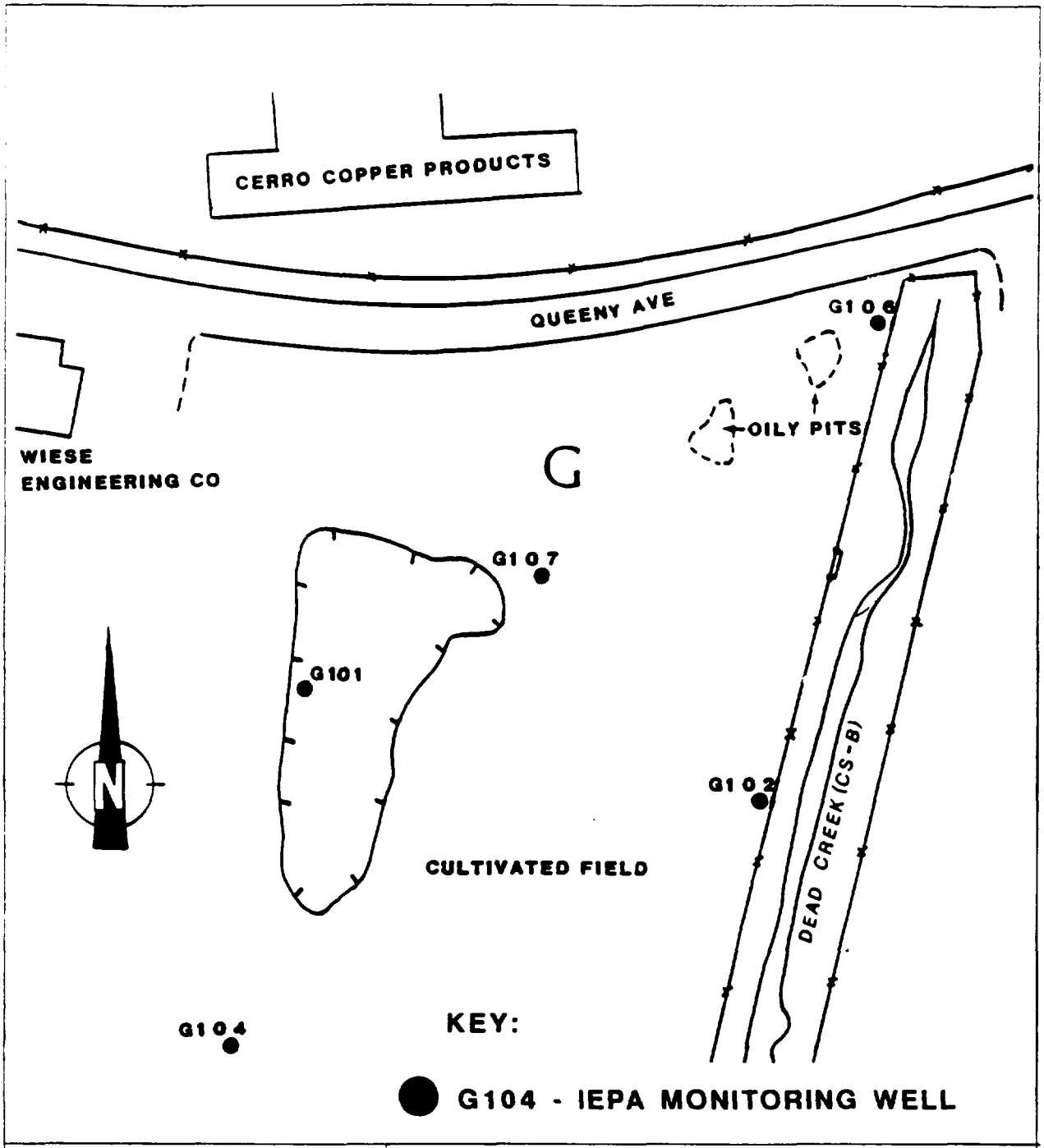
TITLE: **SITE LOCATION MAP**		FIGURE #: **1**
SITE: **SAUGET AREA 1 - SITE G**		SCALE: **1" = 2000'**
CITY: **SAUGET**	STATE: **ILLINOIS**	PAN: **EIL0836SAA**



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Chicago, IL 60604

TITLE		FIGURE #
SITE FEATURES MAP		2
SITE		SCALE
SAUGET AREA 1 - SITE G		NOT TO SCALE
CITY	STATE	PAN
SAUGET	ILLINOIS	EIL0836SAA

a residential area. The field south of the site is used for farming.

2.2 Site History

As recorded in site file information pertaining to previous site investigations, the surface of Site G is littered with demolition debris and metal wastes. Two small pits are located in the northeast and east-central portions of the site. Oily and tar-like wastes, along with scattered corroded drums, were observed in these areas. A mounded area was observed in the western portion of the site. Protruding from this mound were several corroded drums. A large depression exists in the south-central portion of the site, which is immediately south of the mounded area. Surface runoff in this area flows toward the depression. It was observed that debris was present over much of the site.

A number of investigations have taken place at Site G. In October of 1984, the Illinois Environmental Protection Agency (IEPA) conducted inspections in order to determine the scope of proposed cleanup work at the site. Analytical results of samples taken from the oily pits on-site revealed a variety of organic compounds.

E & E, Inc., under an IEPA contract, conducted an Extensive Site Investigation (ESI) of the DCP sites from 1985 to 1987 and in May of 1988 submitted an ESI Report to IEPA, detailing assessment information from the DCP sites. In May of 1987, U.S. EPA conducted an emergency response at the site and collected samples, results of which indicated that high levels of organic contamination exist in surficial soils. As a result, Monsanto Chemical Company, under U.S. EPA supervision, constructed a chain-link fence surrounding Site G. According to site file information, aliphatic hydrocarbons, chloroanilines, chlorobenzenes, chlorophenols, polychlorinated biphenyls (PCBs), phenanthrene, and pyrene were identified at Site G.

According to the Sauget Fire Department (SFD) Fire Chief R. Thorton, the SFD had been called out 4 times to extinguish fires at the site since mid-March, 1994, on the following dates: March 18, 21, 22, and June 3. The cause of the fires is believed to be spontaneous combustion. The U.S EPA and IEPA returned to the Sauget Area 1: Site G to assess the potential threat to human health and the environment as a result of these fires.

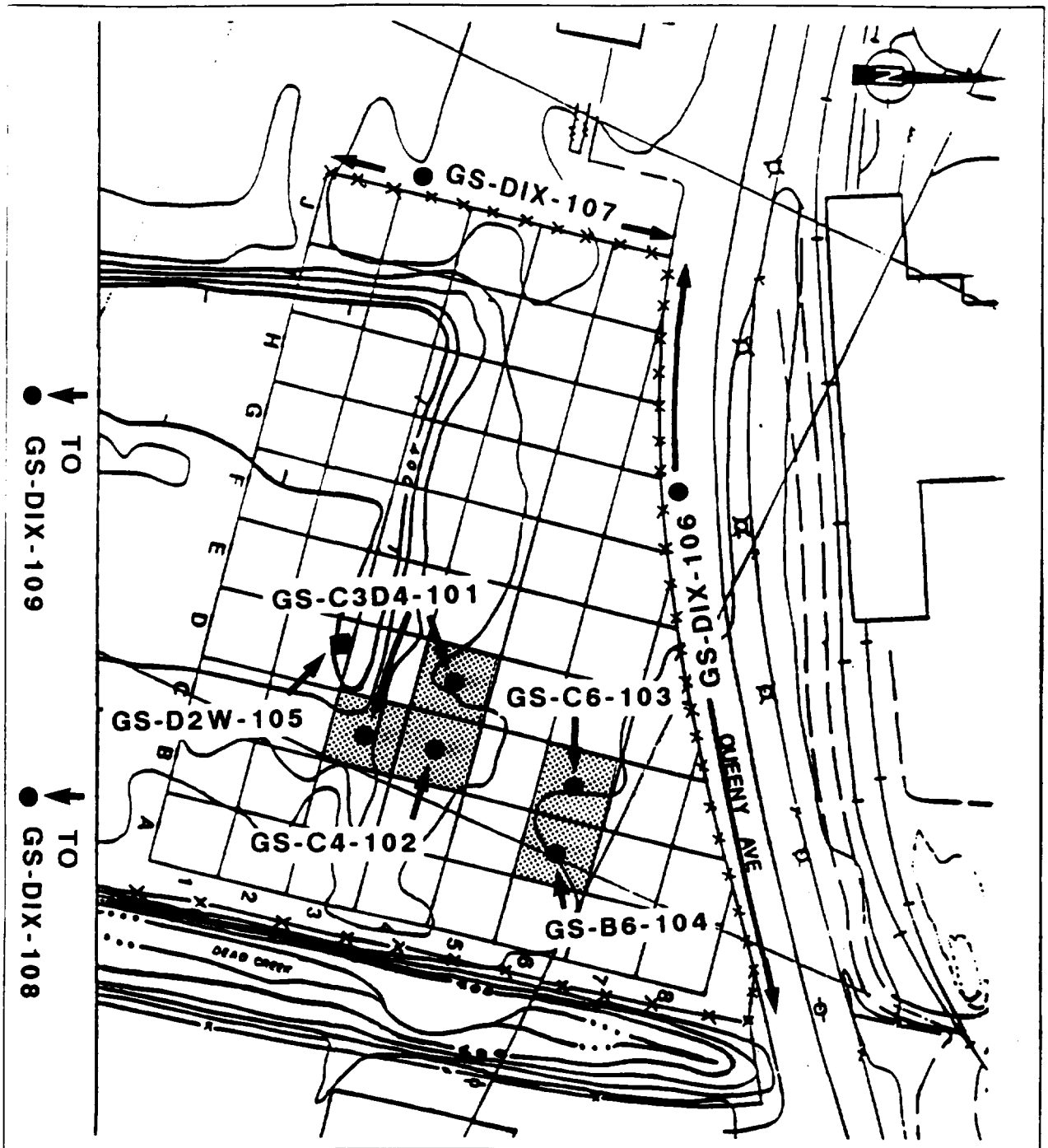
Current file information indicates that the site owners are Cerro Copper Products Company, Wiese Engineering Company, Emily Hankins, and Myrtle Hankins.

3.0 SITE ASSESSMENT

On May 27, 1994, E & E TAT member Steve Skare met U.S. EPA OSC

Samuel Borries and IEPA officials Paul Takacs and Kim Hubbard at the Sauget Area 1: Site G. During the initial reconnaissance, the TAT and OSC performed air monitoring of the site for volatile organic compounds (VOCs) using a HNU photoionzer and explosive gases using an explosimeter. Following the site walk-through, TAT collected various soil and water samples on site (see Figure 3 - Sampling Location Map). A deep ravine with a red-colored, crystalline solid, was smoldering, with wisps of gray smoke emanating from it, evidence that previous fires may have been the result of spontaneous chemical reactions. Readings of 70 ppm above background were noted at the areas of the burning red material. Two large oily tar pits were found at the north central and northeast portions of the site with signs of distressed vegetation evident. Several corroded drums were observed in this area. In other areas, a yellow solid resembling sulfur was noticed. Debris and refuse were also found throughout the site. A fence surrounds the entire site, with locked gates located on the north and west sides of the landfill. A water-filled depression, most likely from natural precipitation and the fire department pumping water onto the landfill, covers approximately one acre of the site and extends off-site beyond the fenced area. This depression extends off-site to the south and receives surface runoff directly from the landfill surface. TAT photodocumented site conditions.

A total of 1 surface water sample and 8 surface soil samples were collected at the site. Composite soil sample GS-C3D4-101 was collected from grid nos. C3 and D4. In the general area around the ravine there were several smoldering and smoking piles of reddish material. Areas where smoke was venting from the ground surface had a red-, white-, yellow-, or blue-precipitated material around the vent. Composite soil sample GS-C4-102 was collected from grid no. C4, which is also from the ravine with the burning material. Composite soil samples GS-C6-103 and GS-B6-104 were collected from the tar pits along the east central and northeast portions of the site, respectively. Surface water sample GS-D2W-105 was collected from the standing-water depression, just south of the burning red material in grid no. D2. Composite soil sample GS-DIX-106 and GS-DIX-107 were collected from west and north areas outside fence perimeters, respectively. Composite soil sample GS-DIX-108 was collected from an open field south of the outside fence perimeter. Composite soil sample GS-DIX-109 was collected from the southwest corner of the intersection of Dead Creek and Judith Lane, near a residential area south of the site. Soil samples were collected within the top 3-inches of soil using stainless steel trowels and composited in dedicated aluminum pie pans prior to placement into 8-ounce glass sample bottles. The water sample was collected in 3 32-ounce glass jars. Samples were sent to Twin City Testing Corporation (Huntingdon), St. Paul, Minnesota for analysis.



LEGEND

- ● SURFACE SOIL SAMPLE
- ■ SURFACE WATER SAMPLE
- ×××-FENCELINE

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TITLE: SAMPLE LOCATION MAP FOR 5/27/94		FIGURE #: 3
SITE: SAUGET AREA 1 - SITE G		SCALE: NOT TO SCALE
CITY: SAUGET	STATE: ILLINOIS	PAN: EIL0836SAA

On June 3, 1994, another fire at the site was reported to U.S. EPA by the IEPA from a report by a local business. On June 6, 1994, E & E TAT member Ronald Bugg met U.S. EPA OSC Samuel Borries and Remedial Project Manager (RPM) Jeff Gore and Paul Takacs of IEPA at 1300 hours at the Sauget Area 1: Site G. At the request of the OSC, various air samples were collected on- and off-site using Summa-brand Passivated Air Canisters to determine the presence of volatile organic compounds (VOCs), and Gillian high volume air samplers using charcoal filter tubes to determine presence of PCBs and pesticides. Four Summa canisters and four Gillian air samplers were placed on-site. One each was placed near a smoldering area, and the remaining 3 of each were placed at the north, south, and west perimeters of the site (see Figure 4 - Air Sample Location Map). Set up of these sampling devices was completed at 1500 hours. One Summa canister and one Gillian air sampler was then placed at a residential area near Dead Creek and Judith Lane (south of the site), and 1 each was placed as a background check on a river levee approximately one mile southwest of the site. After collecting the required sample volumes, the canisters and air samplers were picked up later the same day. TAT photodocumented site conditions. The Summa sample canisters and Gillian air samples, along with a blank sample, were sent to Enseco, City of Industry, California for analysis.

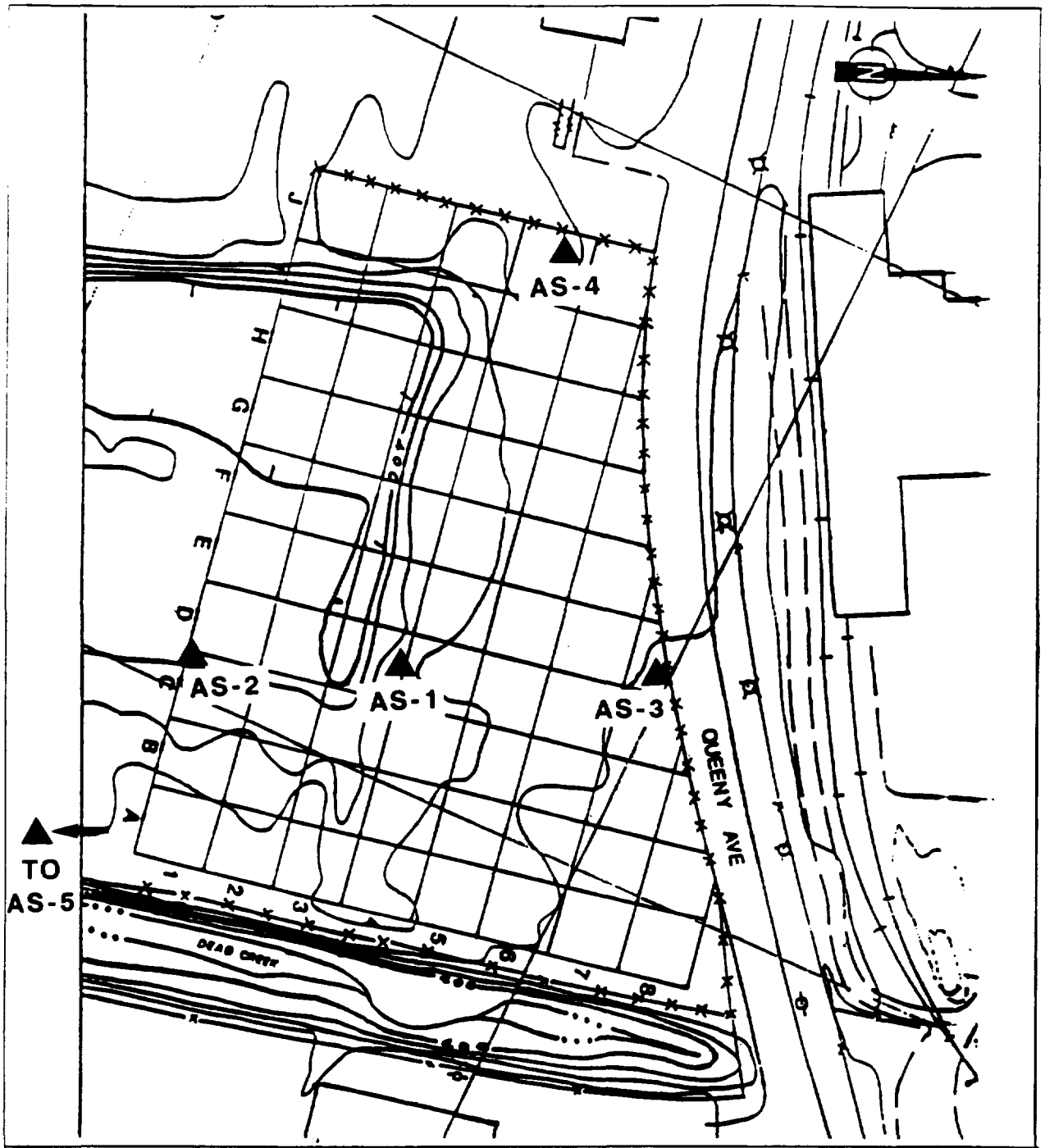
4.0 ANALYTICAL RESULTS AND DISCUSSION

The soil samples from the May 27, 1994, site visit were analyzed for Total and Toxicity Characteristic Leachate Procedure (TCLP) volatile organic compounds, Total and TCLP semi-volatile organic compounds, Polychlorinated biphenyls (PCBs) and pesticides, dioxin and dioxin isomers, and Total and TCLP Resource Conservation and Recovery Act (RCRA) metals. The air samples collected from the June 6, 1994, site visit were analyzed for total volatile organics.

Results of the chemical analyses performed on both sets of TAT collected samples appears in Appendix B. Summaries of selected results are presented in Tables 1 through 4. Summary of analytical results for the 7 air samples collected June 6 are found in Table 5. All data were reviewed and validated by TAT staff to verify data quality.

The oily material contained in soil samples GS-C4-103 and GS-D4-104 (collected from the oil tar pits) is considered hazardous because it exceeded the Toxic Substance Control Act (TSCA) limits for PCBs (50 ppm). PCB Arochlor 1260 was detected in samples GS-C3D4-101 (15,000 ppm) and GS-C6-103 (400 ppm).

Total dioxin equivalence levels, including tetra- thru octa-dioxins and dibenzo-furans, exceeded U.S. EPA removal action limits (RAL) guidelines of 1 ppb for residential areas in samples GS-C3D4-101 (>137.74 ppb), GS-C4-102 (2.053 ppb), GS-C6-103



LEGEND

▲ SUMMA AIR SAMPLE

✕✕✕ FENCELINE

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TITLE: SAMPLE LOCATION MAP - 6/6/94		FIGURE #: 4
SITE: SAUGET AREA 1 - SITE G		SCALE: NOT TO SCALE
CITY: SAUGET	STATE: ILLINOIS	PAN: EIL0836SAA

TABLE 1
SELECTED SAMPLING RESULTS
FROM MAY 27, 1994
Sauget Area 1: Site G
PCBs/PESTICIDES

PARAMETER	SAMPLE ID NUMBERS				
	GS-C3D4-101	GS-C4-102	GS-C6-103	GS-B6-104	GS-D2W-105
PCBs	PARTS PER MILLION (PPM)				
PCB 1260	15,000	U	400	U	U
PESTICIDES	PARTS PER BILLION (PPB)				
endrin	190,000J	6,900J	5,800J	3,100J	U
endrin aldehyde	U	2,200J	U	U	U
4,4'-DDD	U	U	3,500J	5,400J	U
4,4'-DDE	U	U	950J	U	U
heptachlor	U	U	500J	U	U

key: U = undetected
All samples analyzed at: Twin City Testing Corporation (Huntingdon)
St. Paul, Minnesota

TABLE 2
SELECTED DATA RESULTS
FROM MAY 27, 1994
Sauget Area 1: Site G
TOTAL AND TCLP SEMIVOLATILES

PARAMETER	SAMPLE ID NUMBERS				
	GS-C3D4-101	GS-C4-102	GS-C6-103	GS-B6-104	GS-D2W-105
TOTALS SEMIVOCS	PARTS PER BILLIONS (PPB)				
phenol	3,300J	U	U	97,000J	U
naphthalene	6,000J	400,000	170,000	5,200,000 E	U
pentachlorophenol	2,800J	U	U	280,000J	U
2-methylnaphthalene	U	U	14,000J	130,000J	U
phenanthrene	U	37,000	78,000J	340,000J	U
fluoranthene	U	U	17,000J	74,000J	U
2,4-dichlorophenol	U	U	U	260,000J	U
4-chloroaniline	U	U	U	1,700,000	U
2,4,6-trichlorophenol	U	U	U	200,000J	U
2-nitroaniline	U	U	U	U	8.4J
bis-(2-ethylhexyl) phthalate	U	U	U	U	13J
n-nitro-so-diphenyl-amine	U	U	U	200,000J	U
chrysene	U	26,000	U	U	U
TCLP SEMIVOCs	PARTS PER BILLION (PPB)				
o-cresol	U	5J	U	U	NT
m- and/or p-cresol	U	320	26	65J	NT

key: U = undetected J = estimated value E = exceeded column height
NT = not tested
All samples analyzed at: Twin City Testing Corporation (Huntingdon)
St. Paul, Minnesota

TABLE 3
SELECTED DATA RESULTS
FROM MAY 27, 1994
Sauget Area 1: Site G
DIOXIN

SAMPLE ID NUMBERS	DIOXIN, TOTAL EQUIVALENCE, PARTS PER TRILLION (PPT)
GS-C3D4-101	>137740
GS-C4-102	2053
GS-C6-103	8423
GS-B6-104	32805
GS-D2W-105	0.0003
GS-DIX-106	2599
GS-DIX-107	21868
GS-DIX-108	22
GS-DIX-109	101

All samples were analyzed at: Twin City Testing Corporation (Huntingdon)
St. Paul, Minnesota

TABLE 4
SELECTED SAMPLING RESULTS
FROM MAY 27, 1994
Sauget Area 1: Site G

TOTAL AND TCLP RCRA METALS

PARAMETER	SAMPLE ID NUMBERS				
	GS-C3D4-101	GS-C4-102	GS-C6-103	GS-B6-104	GS-D2W-105
TOTAL METALS	PARTS PER BILLION (PPB)				
arsenic	45	55	8.6	U	U
barium	1,100	3,300	330	11,000	110
cadmium	6.4	4.7	6.1	25	U
chromium	43	140	16	58	U
lead	450	450	210	1,200	U
mercury	3.0	2.0	0.83	1.8	U
selenium	U	U	U	U	U
silver	1.4	U	2.6	6.5	U
TCLP METALS	PARTS PER BILLION (PPB)				
arsenic	U	U	U	U	NT
barium	170	580	970	4,700	NT
cadmium	50	47	25	U	NT
chromium	11	29	U	U	NT
lead	57	110	76	53	NT
mercury	U	U	U	U	NT
selenium	U	U	U	U	NT
silver	U	U	U	U	NT

key: U = undetected NT = not tested
All samples analyzed at: Twin City Testing Corporation (Huntingdon)
St. Paul, Minnesota

TABLE 5
SELECTED AIR DATA RESULTS
FROM JUNE 6, 1994
Sauget Area 1: Site G

TOTAL VOLATILE ORGANIC COMPOUNDS, PCBs

PARAMETER	SAMPLE ID NUMBERS						
	AS-1	AS-2	AS-3	AS-4	AS-5	BKGD	BLNK
TOTALS VOCS	PARTS PER BILLIONS (PPB)						
acetone	87	13	22	12	22	20	U
2-butanone	30	U	U	U	U	U	U
benzene	130	U	U	U	U	U	U
toluene	2.1	U	U	U	U	U	U
ethylbenzene	3.0	U	U	U	U	U	U
xylenes (total)	14	U	8.1	U	2.1	U	U
1,2,4-trichlorobenzene	35	U	10	U	4.3	U	U
PCBs (ug/m^3)	4.85	U	U	U	U	U	U

key: U = undetected
All samples analyzed at: Enseco
City of Industry, California

5.0 THREATS TO HUMAN HEALTH AND THE ENVIRONMENT

Paragraph (b)(2) of Part 300.415 of the National Contingency Plan lists factors to be considered when determining the appropriateness of a potential removal action at a site. The following discussion presents a summary of those factors for the Sauget Area 1: Site G site.

Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chains.

Analytical results from the soil samples collected on May 27 1994, indicate the presence of hazardous substances at the Sauget Area 1: Site G site. The potential exists for trespassers, vandals, or scavengers to come in contact with hazardous substances, especially from contaminated soils and from deteriorated drums in exposed areas. Plants and animals can come in contact with hazardous substances and can pass along contaminants via the food chain to larger animal species, and potentially to humans.

The potential exists for migration of soil contaminants via airborne dust or from run-off discharges leading to the water-filled depression.

Soil samples collected by TAT from on-site and along the site perimeter contained high levels of dioxin, PCBs, pesticides, semi-volatiles, and Volatile organic compounds. During fire events, contaminated soil and combustion materials can migrate via drainage paths off-site to navigatible waterways, including the water-filled depression and Dead Creek. Dioxins and PCBs have a high affinity for soils and can be carried via airborne dusts off-site to nearby residential and industrial areas.

Weather conditions that may cause pollutants or contaminants to migrate or be released.

All contaminants on-site are found outdoors under constant exposure to the weather. Exposure to the elements can cause excessive degradation of the on-site waste containers, which could cause further migration of contaminants if hazardous substances leaked.

Threat of fire or explosion.

Deteriorated and scorched drums were observed scattered on the landfill surface. The potential for a continued fire exists. According to the Sauget Fire Department (SFD) fire chief, the SFD has been called to the site four times since mid-March to extinguish site fires. Continued burning of the site will increase the likelihood of contaminants becoming airborne and may affect the nearby business and residential populations.

5.1 CHEMICAL HAZARDS OF CONTAMINANTS DOCUMENTED AT THE SITE

Polychlorinated biphenyls (PCBs) are suspected carcinogens in humans and known animal mutagens. These compounds cause damage to skin, liver, eyes, and the respiratory system. Acute symptoms include skin, eye, nose, and throat irritation, vomiting, edema, abdominal pain, fatigue, and pigmentation of skin and nails. Chronic effects cause chloracne, liver damage, heart/kidney edema, possible embryotoxin in unborn, and gray-brown skin. The Occupational Safety and Health Administration (OSHA) Permissible exposure limit (PEL) is 0.09 ppm (skin) and 1.0 ppm (inhalation) for PCB Arochlor 1242 and 0.03 ppm (skin) and 0.5 ppm (inhalation) for PCB Arochlor 1254. No data found for PCB Arochlor 1260 available.

Oils other than PCB-containing oils cause skin and eye irritation, and may be harmful if ingested. Typical oils are flammable and have a flashpoint of 100°F. Many oils may also contain low levels of other contaminants, including aromatic hydrocarbons.

Dioxin is acutely toxic and a suspected human carcinogen. In acute exposures, dioxin causes liver toxicity, symptoms of diarrhea, headache, chloracne, weight loss, psychological disturbances, and inflammation of the kidney and bladder. Chronic exposure suppresses immune systems and causes in lab animals. Dioxin is a solid under normal conditions, and is transferred primarily through airborne particulates and sediment migration through surface water run-off.

6.0 SUMMARY

The presence of the threats addressed above will require the handling of several thousand cubic yards of contaminated surficial soils.

At this time, it is proposed that the site will be stabilized by the following process:

1) Extinguish the fire by an appropriate means;

2) Remove/consolidate all surface vegetation and debris;

3) Solidify/stabilize semi-solid material in tar pits;

4) Remove water in depression and treat if necessary;

5) Backfill the part of the water-filled depression impacted by the site;

6) Remove and consolidate contaminated off-site sediment and soil;

7) Properly close/abandon any monitoring wells that interfere with cap placement;

8) Level the site to grade;

9) Place a 2-foot clay impermeable layer below frost zone layer with a 6-inch topsoil layer; and

10) Establish necessary erosion control measures.

No treatment or disposal of site wastes are being proposed at this time.

The removal action is assumed to be completed in 60 10-hour work days with 2 phases of work. Phase 1 will include the extinguishing any areas that are on fire or smoldering and solidify/stabilize surface material. After the fire has been put out, phase 2 will be initiated and will include the removal and clearing of all non-hazardous materials, backfilling the water-filled depression, and bringing the site to grade for cap placement. Clay, frostzone, and topsoil layers will be installed, the area will be reseeded, and the site will be secured prior to site demobilization.

7.0 EVALUATION OF CLEANUP COSTS

A cost estimate for the stabilization and removal of solid and liquid wastes at the Sauget Area 1: Site G site have been based on several assumptions. It is inappropriate to estimate waste volumes at the site, due to lack of information regarding the composition and areal extent of contamination. However, if an assumed surface area of approximately 197,000 square feet (based on 4.5 acres) is leveled to grade and a two-foot clay cap is placed on top of the landfill, followed by a 2.5-foot frostzone layer and 6-inches of topsoil. A volume of approximately 14,550 cubic yards of clean clay, 18,190 cubic yards of fill material for frostzone layer, and 3,640 cubic yards of topsoil will be needed.

Off-site disposal methods for the waste streams from this site are considered impractical and inappropriate given the immediate time frame needed for the removal and the mixed waste types involved (inorganics and organics).

Additional assumptions include:

- Riedel Environmental was assumed to be the contractor for this removal action.

- Any nonhazardous material (debris, soil, crushed containers, scrap, etc.) located on the landfill will be used as fill material in the site depression.

- Davis-Bacon Act (DBA) wages were used for the labor categories.

- No demurrage costs associated with the transportation of the fill material is assumed.

- An approximate cost of $11/cy for clean clay, frostzone fill material, and clean topsoil was used, including delivery charges.

Refer to the cost projection in Attachment C.

8.0 COST PROJECTION SUMMARY

CONTRACTOR PERSONNEL	$402,925.72
CONTRACTOR EQUIPMENT	85,825.60
UNIT RATE MATERIALS	441,178.10
AT COST MATERIALS	30,670.75
SUBCONTRACTORS	259,996.00
WASTE TRANSPORTATION	0.00
WASTE DISPOSAL	$ 6,270.00
CLEANUP CONTRACTOR SUBTOTAL	$1,226,866.17
EXTRAMURAL SUBTOTAL	$1,226,866.17
20% EXTRAMURAL CONTINGENCY	$245,373.23
EXTRAMURAL SUBTOTAL	$1,472,239.40
TAT PERSONNEL	$65,540.00
TOTAL TAT COSTS	$65,540.00
EXTRAMURAL SUBTOTAL	$1,537,779.40
15% PROJECT CONTINGENCY	$230,666.91
TOTAL EXTRAMURAL COST	$1,768,446.31
EPA REGIONAL PERSONNEL	$27,225.00
EPA HEADQUARTERS DIRECT (10% OF REGIONAL HOURS)	$2,160.00
EPA INDIRECT	$38,160.00
EPA TOTAL	$67,545.00
PROJECT TOTAL	$1,835,991.31

A

ATTACHMENT A - SITE PHOTOGRAPHS

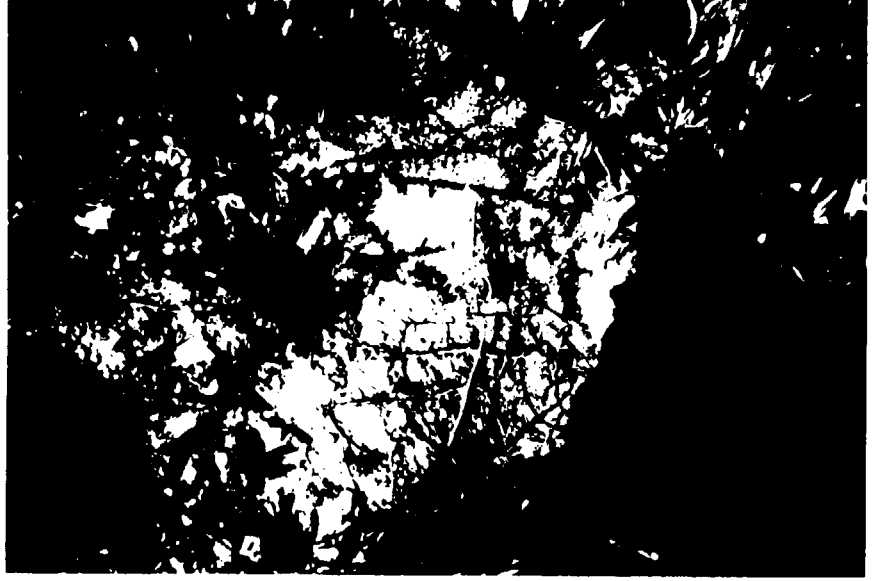
SITE NAME: SAUGET AREA 1
TDD: T05-9405-006

DATE: 5/27/94
TIME: 0947 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: DOWN

SUBJECT: CLOSEUP OF RED CRYSTALLINE MATERIAL BURNING.



SITE NAME: SAUGET AREA 1
TDD: T05-9405-006

DATE: 5/27/94
TIME: 0948 HOURS

PHOTOGRAPHER: SAM BORRIES

DIRECTION: DOWN

SUBJECT: ANOTHER VIEW OF BURNING RED MATERIAL.

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **5/27/94**
TIME: **0956 HOURS**

PHOTOGRAPHER: **STEVEN SKARE**

DIRECTION: **SE**

SUBJECT: **TAR PIT NEAR DEAD CREEK AT EAST END OF SITE.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **5/27/94**
TIME: **1000 HOURS**

PHOTOGRAPHER: **STEVEN SKARE**

DIRECTION: **SW TO SE**

SUBJECT: **PANORAMIC SHOT OF WATER-FILLED DEPRESSION AND DUMP AREA WITH BURNING RED MATERIAL.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **5/27/94**
TIME: **1003 HOURS**

PHOTOGRAPHER: **STEVEN SKARE**

DIRECTION: **SW TO NE**

SUBJECT: **PAN SHOT CONTINUATION FROM PREVIOUS.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **5/27/94**
TIME: **1005 HOURS**

PHOTOGRAPHER: **STEVEN SKARE**

DIRECTION: **N**

SUBJECT: **CLOSE UP OF RED BURNING CRYSTALLINE PILE.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **5/27/94**
TIME: **1007 HOURS**

PHOTOGRAPHER: **STEVEN SKARE**

DIRECTION: **SE TO SW**

SUBJECT: **PAN SHOT OF WATER-FILLED DEPRESSION.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **5/27/94**
TIME: **1007 HOURS**

PHOTOGRAPHER: **STEVEN SKARE**

DIRECTION: **SE TO SW**

SUBJECT: **CONTINUATION OF PAN SHOT OF WATER-FILLED DEPRESSION.**

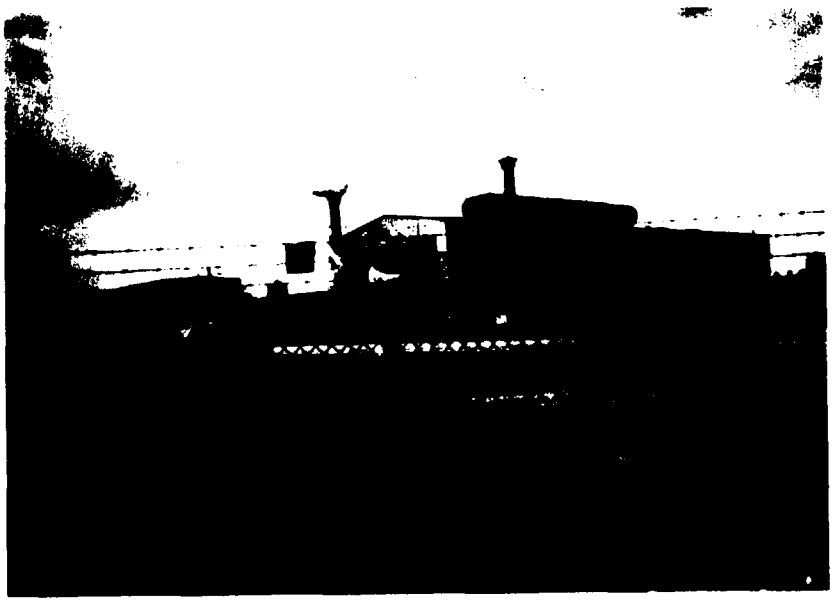
SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **6/6/94**
TIME: **1315 HOURS**

PHOTOGRAPHER: **R. BUGG**

DIRECTION: **N**

SUBJECT: **VIEW OF DEAD CREEK AS VIEWED FROM JUDITH LANE. NOTE THAT THE AREA IS FENCED OFF FROM THE PUBLIC.**



SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **6/6/94**
TIME: **1330 HOURS**

PHOTOGRAPHER: **R. BUGG**

DIRECTION: **W**

SUBJECT: **WEST FENCE PERIMETER AT SAMPLE STATION AS-4, NEAR WIESE ENGINEERING FACILITY. NOTE THE SUMMA AIR CANISTER AND GILLIAN AIR PUMP ON THE FENCE POST USED TO COLLECT AIR SAMPLES.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **6/6/94**
TIME: **1415 HOURS**

PHOTOGRAPHER: **R. BUGG**

DIRECTION: **W**

SUBJECT: **VIEW OF NORTHEAST SECTION OF RAVINE SHOWING DRUM WASTES WHERE SMOLDERING FIRE REKINDLED ON JUNE 3, 1994.**

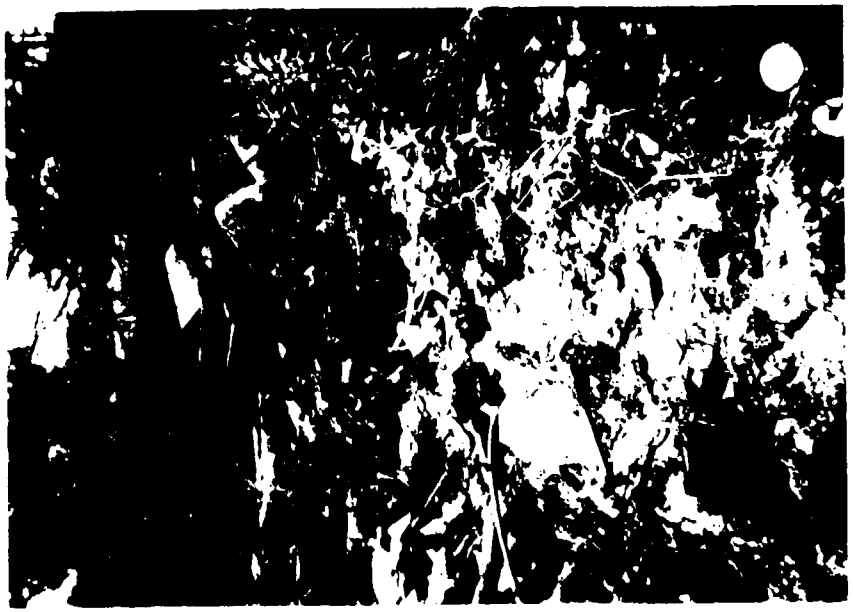
SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **6/6/94**
TIME: **1430 HOURS**

PHOTOGRAPHER: **R. BUGG**

DIRECTION: **SW**

SUBJECT: **ANOTHER VIEW OF SMOLDERING FIRE LOCATED IN RAVINE. NOTE THE PROXIMITY OF THE RAVINE TO THE WATER-FILLED SURFACE DEPRESSION.**



SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **6/6/94**
TIME: **1445 HOURS**

PHOTOGRAPHER: **R. BUGG**

DIRECTION: **S**

SUBJECT: **ANOTHER VIEW OF RAVINE WITH EXPOSED DRUM WASTES AND SMOLDERING FIRE.**

SITE NAME: **SAUGET AREA 1**
TDD: **T05-9405-006**

DATE: **6/6/94**
TIME: **1500 HOURS**

PHOTOGRAPHER: **R. BUGG**

DIRECTION: **DOWN**

SUBJECT: **SOUTHEAST SECTION OF RAVINE SHOWING SMOLDERING FIRE AND BURN RESIDUE.**

B

ATTACHMENT B - ANALYTICAL DATA PACKAGE

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 7, 1994

TO: Steven Skare, Project Manager, E & E, Chicago, IL

FROM: David Hendren, TAT-Chemist, E & E, Chicago, IL DH

THRU: Pat Zwilling, ATATL, E & E, Chicago, IL

SUBJ: **Organic Data Quality Assurance Review** for polychlorinated dibenzodioxins (PCDD) and polychlorinated dibenzofurans (PCDF) for Sauget Area One, Sauget, St. Clair County, Illinois

REF: Analytical TDD:T05-9405-803 Project TDD:T05-9405-006
Analytical PAN:EIL0836AAA Project PAN:EIL0836SAA

The data quality assurance review of 8 soil and 1 water samples collected from the site has been completed. Analyses for PCDD/PCDF were performed by Twin City Testing Corporation (Huntingdon) of St. Paul, Minnesota in accordance with USEPA SW-846 Method 8290.

The samples were numbered in the field as follows. The corresponding laboratory identification numbers are provided:

TAT Sample # corresponds to - >	Laboratory Sample #
GS-C304-101	25147
GS-C4-102	25150
GS-C6-103	25152
GS-B6-104	25154
GS-D2W-105	25155
GS-DIX-106	25156
GS-DIX-107	25157
GS-DIX-108	25158
GS-DIX-109	25159

Data Qualifications:

I. **Holding Time:** Acceptable

The samples were collected on 5/27/94, extracted between 6/2/94 and 6/10/94 and analyzed between 6/9/94 and 6/14/94. The holding time criteria of 6 months from collection to extraction was satisfied. Extracts were analyzed within 40 days following extraction.

II. **Instrument Performance:** Acceptable

The mass spectrometer was tuned to achieve adequate mass resolution. The resolution between 2,3,7,8-TCDD and adjacent isomers demonstrated less than 25% valley.

III. **Calibration:**

A. Initial Calibration: Acceptable

A 5-point initial calibration was performed prior to analysis for all analytes. The percent relative standard deviation for all analytes was less than 15 %. Ion abundance ratios for all analytes were within acceptable limits.

B. Continuing Calibration: Acceptable

The percent difference (%D) between initial and continuing calibration exceeded 25% for OCDD(28.5%) on 6/9/94. Qualification was not appropriate. All ion abundance ratios were within acceptable limits.

IV. **Method Blank:** Acceptable

A method blank was prepared and analyzed for each matrix on each day of analysis. Low concentrations of some target analytes were detected in the soil blanks. Since the reported values for the samples greatly exceeded these amounts, qualification was not necessary.

V. **Internal Standards:** Acceptable

The recoveries of the 13C-internal standards was acceptable in all samples except 25147 where interferences prevented the detection of both the native analytes and internal standards. The laboratory designated the affected analyte values as "INT ".

VI. **Matrix Spike/Matrix Spike Duplicate:** Acceptable

Recoveries for the matrix spike and matrix spike duplicate were within acceptable limits.

VII. **Overall Assessment of Data For Use:**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-01 April, 1990). Based upon the information provided, the data are acceptable for use.

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-C304-101 (1:2 DILUTION)
TCT Sample ID.....25147
Analysis Date.....6/14/94 15:52
Filename.....S40614I
Injected By.....CML
Total Amount Extracted...0.0011 kg
% Moisture..... 20.6 %
ICAL Date.....5/24/94
CCAL Filename.....S40614B
Method Blank ID.....BLANK-060994A
Extraction Date.....6/09/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg
2378-TCDF	INT		INT
TOTAL TCDF	INT		-----
2378-TCDD	INT		INT
TOTAL TCDD	INT		-----
12378-PeCDF	INT		INT
23478-PeCDF	INT		INT
TOTAL PeCDF	INT		-----
12378-PeCDD	INT		INT
TOTAL PeCDD	INT		-----
123478-HxCDF	550000	**	-----
123678-HxCDF	310000	**	-----
234678-HxCDF	170000		-----
123789-HxCDF	210000		-----
TOTAL HxCDF	1700000	**	-----
123478-HxCDD	1100		-----
123678-HxCDD	3900		-----
123789-HxCDD	1900		-----
TOTAL HxCDD	19000		-----
1234678-HpCDF	380000	**	-----
1234789-HpCDF	540000		-----
TOTAL HpCDF	1000000	**	-----
1234678-HpCDD	200000		-----
TOTAL HpCDD	390000		-----
OCDF	650000		-----
OCDD	1200000	**	-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-13C....	2.00	INT
2378-TCDD-13C....	2.00	INT
12378-PeCDF-13C..	2.00	INT
23478-PeCDF-13C..	2.00	INT
12378-PeCDD-13C..	2.00	INT
123478-HxCDF-13C.	2.00	INT
123678-HxCDF-13C.	2.00	75
234678-HxCDF-13C.	2.00	101
123789-HxCDF-13C.	2.00	INT
123478-HxCDD-13C.	2.00	94
123678-HxCDD-13C.	2.00	82
1234678-HpCDF-13C	2.00	79
1234789-HpCDF-13C	2.00	79
1234678-HpCDD-13C	2.00	78
OCDD-13C.....	4.00	62
1234-TCDD-13C....	2.00	NA
123789-HxCDD-13C.	2.00	NA
2378-TCDD-37Cl4..	0.20	INT

Total 2378-TCDD Equivalence: >137740 ng/kg
(Using ITE Factors/DB-5 Data)

**Saturated signal.

All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable
INT = Interference

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-C4-102 (1:2 DILUTION)
TCT Sample ID.....25150
Analysis Date.....6/9/94 01:14
Filename.....S40608Q
Injected By.....MCH
Total Amount Extracted...0.0109 kg
% Moisture..... 6.6 %
ICAL Date.....5/24/94
CCAL Filename.....S40608N
Method Blank ID.....BLANK-060294
Extraction Date.....6/2/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg
2378-TCDF	ND		3000
TOTAL TCDF	11000		-----
2378-TCDD	59		-----
TOTAL TCDD	3500		-----
12378-PeCDF	1300		-----
23478-PeCDF	2500		-----
TOTAL PeCDF	8600		-----
12378-PeCDD	170		-----
TOTAL PeCDD	1600		-----
123478-HxCDF	1700		-----
123678-HxCDF	780		-----
234678-HxCDF	720		-----
123789-HxCDF	100		-----
TOTAL HxCDF	7200		-----
123478-HxCDD	180		-----
123678-HxCDD	430		-----
123789-HxCDD	380		-----
TOTAL HxCDD	5900		-----
1234678-HpCDF	2700		-----
1234789-HpCDF	270		-----
TOTAL HpCDF	6900		-----
1234678-HpCDD	8100		-----
TOTAL HpCDD	16000		-----
OCDF	9600		-----
OCDD	45000	**	-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-13C....	2.00	79
2378-TCDD-13C....	2.00	80
12378-PeCDF-13C..	2.00	76
23478-PeCDF-13C..	2.00	80
12378-PeCDD-13C..	2.00	81
123478-HxCDF-13C.	2.00	81
123678-HxCDF-13C.	2.00	72
234678-HxCDF-13C.	2.00	75
123789-HxCDF-13C.	2.00	78
123478-HxCDD-13C.	2.00	84
123678-HxCDD-13C.	2.00	71
1234678-HpCDF-13C	2.00	80
1234789-HpCDF-13C	2.00	72
1234678-HpCDD-13C	2.00	80
OCDD-13C.....	4.00	59
1234-TCDD-13C....	2.00	NA
123789-HxCDD-13C.	2.00	NA
2378-TCDD-37Cl4..	0.20	INT

Total 2378-TCDD Equivalence: 2053 ng/kg
(Using ITE Factors/DB-5 Data)

**Value obtained from runfile S40613D.

All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable
INT = Interference

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-C6-103 (1:2 DILUTION)
TCT Sample ID.....25152
Analysis Date.....6/14/94 16:43
Filename.....S40614J
Injected By.....CML
Total Amount Extracted...0.0013 kg
% Moisture..... 19.4 %
ICAL Date.....5/24/94
CCAL Filename.....S40614B
Method Blank ID.....BLANK-061094
Extraction Date.....6/10/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	240	*	-----	2378-TCDF-13C....	2.00	66
TOTAL TCDF	54000		-----	2378-TCDD-13C....	2.00	67
				12378-PeCDF-13C..	2.00	57
2378-TCDD	210		-----	23478-PeCDF-13C..	2.00	54
TOTAL TCDD	18000		-----	12378-PeCDD-13C..	2.00	75
				123478-HxCDF-13C.	2.00	69
12378-PeCDF	220		-----	123678-HxCDF-13C.	2.00	57
23478-PeCDF	830		-----	234678-HxCDF-13C.	2.00	64
TOTAL PeCDF	17000		-----	123789-HxCDF-13C.	2.00	80
				123478-HxCDD-13C.	2.00	71
12378-PeCDD	1100		-----	123678-HxCDD-13C.	2.00	65
TOTAL PeCDD	1100		-----	1234678-HpCDF-13C	2.00	55
				1234789-HpCDF-13C	2.00	75
123478-HxCDF	ND		46000	1234678-HpCDD-13C	2.00	62
123678-HxCDF	1200		-----	OCDD-13C.....	4.00	INT
234678-HxCDF	1700		-----			
123789-HxCDF	680		-----	1234-TCDD-13C....	2.00	NA
TOTAL HxCDF	34000		-----	123789-HxCDD-13C.	2.00	NA
123478-HxCDD	1700		-----	2378-TCDD-37Cl4..	0.20	INT
123678-HxCDD	7400		-----			
123789-HxCDD	4000		-----			
TOTAL HxCDD	50000		-----			
				Total 2378-TCDD Equivalence:	8423	ng/kg
1234678-HpCDF	34000		-----	(Using ITE Factors/DB-5 Data)		
1234789-HpCDF	4500		-----			
TOTAL HpCDF	140000		-----			
1234678-HpCDD	270000		-----			
TOTAL HpCDD	530000		-----			
OCDF	160000		-----			
OCDD	2300000		-----			

* Value may include contributions from other TCDF isomers.

All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable
INT = Interference

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-B6-104 (1:2 DILUTION)
TCT Sample ID.....25154
Analysis Date.....6/14/94 14:59
Filename.....S40614H
Injected By.....CML
Total Amount Extracted...0.0011 kg
% Moisture..... 83.0 %
ICAL Date.....5/24/94
CCAL Filename.....S40614B
Method Blank ID.....BLANK-060994A
Extraction Date.....6/09/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	ND		830	2378-TCDF-13C....	2.00	85
TOTAL TCDF	110000		-----	2378-TCDD-13C....	2.00	104
				12378-PeCDF-13C..	2.00	70
2378-TCDD	190		-----	23478-PeCDF-13C..	2.00	81
TOTAL TCDD	36000		-----	12378-PeCDD-13C..	2.00	89
				123478-HxCDF-13C.	2.00	99
12378-PeCDF	ND		5400	123678-HxCDF-13C.	2.00	74
23478-PeCDF	970		-----	234678-HxCDF-13C.	2.00	79
TOTAL PeCDF	58000		-----	123789-HxCDF-13C.	2.00	80
				123478-HxCDD-13C.	2.00	101
12378-PeCDD	ND		3200	123678-HxCDD-13C.	2.00	76
TOTAL PeCDD	12000		-----	1234678-HpCDF-13C	2.00	74
				1234789-HpCDF-13C	2.00	80
123478-HxCDF	3100		-----	1234678-HpCDD-13C	2.00	82
123678-HxCDF	ND		12000	OCDD-13C.....	4.00	67
234678-HxCDF	6300		-----			
123789-HxCDF	ND		4400	1234-TCDD-13C....	2.00	NA
TOTAL HxCDF	200000		-----	123789-HxCDD-13C.	2.00	NA
123478-HxCDD	9600		-----	2378-TCDD-37Cl4..	0.20	95
123678-HxCDD	29000		-----			
123789-HxCDD	20000		-----			
TOTAL HxCDD	230000		-----			
1234678-HpCDF	310000		-----			
1234789-HpCDF	13000		-----			
TOTAL HpCDF	1100000		-----			
1234678-HpCDD	1300000		-----			
TOTAL HpCDD	2700000		-----			
OCDF	1400000		-----			
OCDD	7700000	**	-----			

Total 2378-TCDD Equivalence: 32805 ng/kg
(Using ITE Factors/DB-5 Data)

**Saturated signal.

All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-D2V-105
TCT Sample ID.....25155
Analysis Date.....6/8/94 16:56
Filename.....S40608I
Injected By.....CML
Total Amount Extracted... 0.90 L
% Moisture.....NA %
ICAL Date.....5/24/94
CCAL Filename.....S40608D
Method Blank ID.....BLANK-060394A
Extraction Date.....6/3/94

NATIVE ISOMERS	CONC. ng/L	LOD ng/L	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	ND	0.0047	2378-TCDF-13C....	2.00	76
TOTAL TCDF	ND	-----	2378-TCDD-13C....	2.00	77
			12378-PeCDF-13C..	2.00	74
2378-TCDD	ND	0.0031	23478-PeCDF-13C..	2.00	76
TOTAL TCDD	ND	-----	12378-PeCDD-13C..	2.00	75
			123478-HxCDF-13C.	2.00	90
12378-PeCDF	ND	0.0098	123678-HxCDF-13C.	2.00	75
23478-PeCDF	ND	0.0049	234678-HxCDF-13C.	2.00	81
TOTAL PeCDF	ND	-----	123789-HxCDF-13C.	2.00	87
			123478-HxCDD-13C.	2.00	89
12378-PeCDD	ND	0.0061	123678-HxCDD-13C.	2.00	76
TOTAL PeCDD	ND	-----	1234678-HpCDF-13C	2.00	85
			1234789-HpCDF-13C	2.00	86
123478-HxCDF	ND	0.0072	1234678-HpCDD-13C	2.00	85
123678-HxCDF	ND	0.0052	OCDD-13C.....	4.00	80
234678-HxCDF	ND	0.0068			
123789-HxCDF	ND	0.0054	1234-TCDD-13C....	2.00	NA
TOTAL HxCDF	ND	-----	123789-HxCDD-13C.	2.00	NA
123478-HxCDD	ND	0.0073	2378-TCDD-37Cl4..	0.20	68
123678-HxCDD	ND	0.0077			
123789-HxCDD	ND	0.0095			
TOTAL HxCDD	ND	-----			
1234678-HpCDF	0.0057	-----			
1234789-HpCDF	ND	0.0100			
TOTAL HpCDF	0.0350	-----			
1234678-HpCDD	ND	0.0300			
TOTAL HpCDD	0.0200	-----			
OCDF	0.0280	-----			
OCDD	0.2100	-----			

Total 2378-TCDD Equivalence: 0.0003 ng/L
(Using ITE Factors/DB-5 Data)

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-DIX-106 (1:2 DILUTION)
TCT Sample ID.....25156
Analysis Date.....6/9/94 04:03
Filename.....S40608T
Injected By.....MCH
Total Amount Extracted...0.0108 kg
% Moisture..... 2.3 %
ICAL Date.....5/24/94
CCAL Filename.....S40608N
Method Blank ID.....BLANK-060294
Extraction Date.....6/2/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg
2378-TCDF	120	*	-----
TOTAL TCDF	1600		-----
2378-TCDD	36		-----
TOTAL TCDD	380		-----
12378-PeCDF	ND		6900
23478-PeCDF	180		-----
TOTAL PeCDF	5800		-----
12378-PeCDD	ND		300
TOTAL PeCDD	260		-----
123478-HxCDF	870		-----
123678-HxCDF	630		-----
234678-HxCDF	1100		-----
123789-HxCDF	160		-----
TOTAL HxCDF	28000		-----
123478-HxCDD	730		-----
123678-HxCDD	2100		-----
123789-HxCDD	1200		-----
TOTAL HxCDD	16000		-----
1234678-HpCDF	26000		-----
1234789-HpCDF	2200		-----
TOTAL HpCDF	76000		-----
1234678-HpCDD	88000		-----
TOTAL HpCDD	180000		-----
OCDF	130000		-----
OCDD	490000	**	-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-13C....	2.00	74
2378-TCDD-13C....	2.00	86
12378-PeCDF-13C..	2.00	73
23478-PeCDF-13C..	2.00	73
12378-PeCDD-13C..	2.00	72
123478-HxCDF-13C.	2.00	92
123678-HxCDF-13C.	2.00	81
234678-HxCDF-13C.	2.00	82
123789-HxCDF-13C.	2.00	84
123478-HxCDD-13C.	2.00	84
123678-HxCDD-13C.	2.00	83
1234678-HpCDF-13C	2.00	82
1234789-HpCDF-13C	2.00	75
1234678-HpCDD-13C	2.00	86
OCDD-13C.....	4.00	**121
1234-TCDD-13C....	2.00	NA
123789-HxCDD-13C.	2.00	NA
2378-TCDD-37Cl4..	0.20	INT

Total 2378-TCDD Equivalence: 2599 ng/kg
(Using ITE Factors/DB-5 Data)

* Value may include contributions from other TCDF isomers.
**Values obtained from runfile S40613G. (Native signal was saturated.)
All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable
INT = Interference

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-DIX-107 (1:10 DILUTION)
TCT Sample ID.....25157
Analysis Date.....6/10/94 15:11
Filename.....S40610H
Injected By.....CML
Total Amount Extracted...0.0111 kg
% Moisture..... 7.1 %
ICAL Date.....5/24/94
CCAL Filename.....S40610B
Method Blank ID.....BLANK-060294
Extraction Date.....6/2/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg
2378-TCDF	ND		550
TOTAL TCDF	11000		-----
2378-TCDD	410		-----
TOTAL TCDD	3500		-----
12378-PeCDF	ND		97000
23478-PeCDF	1300		-----
TOTAL PeCDF	55000		-----
12378-PeCDD	3600		-----
TOTAL PeCDD	12000		-----
123478-HxCDF	7800		-----
123678-HxCDF	8400		-----
234678-HxCDF	15000		-----
123789-HxCDF	880		-----
TOTAL HxCDF	190000		-----
123478-HxCDD	7600		-----
123678-HxCDD	32000		-----
123789-HxCDD	12000		-----
TOTAL HxCDD	200000		-----
1234678-HpCDF	190000	**	-----
1234789-HpCDF	24000		-----
TOTAL HpCDF	220000	**	-----
1234678-HpCDD	480000	**	-----
TOTAL HpCDD	940000	**	-----
OCDF	1600000	**	-----
OCDD	2100000	**	-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-13C....	2.00	86
2378-TCDD-13C....	2.00	96
12378-PeCDF-13C..	2.00	84
23478-PeCDF-13C..	2.00	108
12378-PeCDD-13C..	2.00	87
123478-HxCDF-13C.	2.00	INT
123678-HxCDF-13C.	2.00	INT
234678-HxCDF-13C.	2.00	74
123789-HxCDF-13C.	2.00	123
123478-HxCDD-13C.	2.00	90
123678-HxCDD-13C.	2.00	80
1234678-HpCDF-13C	2.00	106
1234789-HpCDF-13C	2.00	83
1234678-HpCDD-13C	2.00	82
OCDD-13C.....	4.00	INT
1234-TCDD-13C....	2.00	NA
123789-HxCDD-13C.	2.00	NA
2378-TCDD-37Cl4..	0.20	INT

Total 2378-TCDD Equivalence: 21868 ng/kg
(Using ITE Factors/DB-5 Data)

**Saturated signals.

All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable
INT = Interference

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-DIX-108
TCT Sample ID.....25158
Analysis Date.....6/10/94 11:13
Filename.....S40610D
Injected By.....CML
Total Amount Extracted...0.0112 kg
% Moisture..... 5.8 %
ICAL Date.....5/24/94
CCAL Filename.....S40610B
Method Blank ID.....BLANK-060294
Extraction Date.....6/2/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg
2378-TCDF	2.5	*	-----
TOTAL TCDF	28.0		-----
2378-TCDD	1.4		-----
TOTAL TCDD	63.0		-----
12378-PeCDF	ND		35.0
23478-PeCDF	ND		3.4
TOTAL PeCDF	43.0		-----
12378-PeCDD	4.8		-----
TOTAL PeCDD	27.0		-----
123478-HxCDF	7.0		-----
123678-HxCDF	5.6		-----
234678-HxCDF	6.7		-----
123789-HxCDF	2.1		-----
TOTAL HxCDF	80.0		-----
123478-HxCDD	6.7		-----
123678-HxCDD	18.0		-----
123789-HxCDD	14.0		-----
TOTAL HxCDD	130.0		-----
1234678-HpCDF	180.0		-----
1234789-HpCDF	14.0		-----
TOTAL HpCDF	640.0		-----
1234678-HpCDD	510.0		-----
TOTAL HpCDD	940.0		-----
OCDF	900.0		-----
OCDD	4300.0		-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-13C....	2.00	70
2378-TCDD-13C....	2.00	77
12378-PeCDF-13C..	2.00	73
23478-PeCDF-13C..	2.00	79
12378-PeCDD-13C..	2.00	88
123478-HxCDF-13C.	2.00	81
123678-HxCDF-13C.	2.00	72
234678-HxCDF-13C.	2.00	87
123789-HxCDF-13C.	2.00	95
123478-HxCDD-13C.	2.00	91
123678-HxCDD-13C.	2.00	80
1234678-HpCDF-13C	2.00	83
1234789-HpCDF-13C	2.00	92
1234678-HpCDD-13C	2.00	96
OCDD-13C.....	4.00	88
1234-TCDD-13C....	2.00	NA
123789-HxCDD-13C.	2.00	NA
2378-TCDD-37Cl4..	0.20	64

Total 2378-TCDD Equivalence: 22 ng/kg
(Using ITE Factors/DB-5 Data)

* Value may include contributions from other TCDF isomers.

All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable

TCT Invoice Number....4411 94-5037

Huntingdon

****
TWIN CITY TESTING CORPORATION
*METHOD 8290 ANALYSIS RESULTS *
****
Client....ECOLOGY & ENVIRONMENT

Client's Sample ID.....GS-DIX-109 (1:2 DILUTION)
TCT Sample ID.....25159
Analysis Date.....6/9/94 02:18
Filename.....S40608R
Injected By.....MCH
Total Amount Extracted...0.0125 kg
% Moisture..... 21.2 %
ICAL Date.....5/24/94
CCAL Filename.....S40608N
Method Blank ID.....BLANK-060294
Extraction Date.....6/2/94

NATIVE ISOMERS	CONC. ng/kg		LOD ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	17.0	*	-----	2378-TCDF-13C....	2.00	79
TOTAL TCDF	180.0		-----	2378-TCDD-13C....	2.00	86
				12378-PeCDF-13C..	2.00	74
2378-TCDD	ND		5.2	23478-PeCDF-13C..	2.00	80
TOTAL TCDD	190.0		-----	12378-PeCDD-13C..	2.00	79
				123478-HxCDF-13C.	2.00	95
12378-PeCDF	ND		180.0	123678-HxCDF-13C.	2.00	84
23478-PeCDF	20.0		-----	234678-HxCDF-13C.	2.00	89
TOTAL PeCDF	210.0		-----	123789-HxCDF-13C.	2.00	87
				123478-HxCDD-13C.	2.00	90
12378-PeCDD	16.0		-----	123678-HxCDD-13C.	2.00	82
TOTAL PeCDD	160.0		-----	1234678-HpCDF-13C	2.00	85
				1234789-HpCDF-13C	2.00	85
123478-HxCDF	33.0		-----	1234678-HpCDD-13C	2.00	93
123678-HxCDF	30.0		-----	OCDD-13C.....	4.00	80
234678-HxCDF	39.0		-----			
123789-HxCDF	9.8		-----	1234-TCDD-13C....	2.00	NA
TOTAL HxCDF	360.0		-----	123789-HxCDD-13C.	2.00	NA
123478-HxCDD	31.0		-----	2378-TCDD-37Cl4..	0.20	79
123678-HxCDD	72.0		-----			
123789-HxCDD	58.0		-----			
TOTAL HxCDD	670.0		-----			
1234678-HpCDF	640.0		-----			
1234789-HpCDF	58.0		-----			
TOTAL HpCDF	2300.0		-----			
1234678-HpCDD	2200.0		-----			
TOTAL HpCDD	4400.0		-----			
OCDF	4100.0		-----			
OCDD	21000.0	**	-----			

Total 2378-TCDD Equivalence: 101 ng/kg
(Using ITE Factors/DB-5 Data)

* Value may include contributions from other TCDF isomers.
**Value obtained from runfile S40613E.
All values are expressed on a dry weight basis.

CONC= Concentration (Totals include 2378-substituted isomers.)
LOD = Limit of Detection
ND = Not Detected
NA = Not Applicable

TCT Invoice Number....4411 94-5037

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 7, 1994

TO: Steven Skare, Project Manager, E & E, Chicago, IL

FROM: David Hendren, TAT-Chemist, E & E, Chicago, IL

THRU: Pat Zwilling, ATATL, E & E, Chicago, IL

SUBJ: **Inorganic Data Quality Assurance Review** for RCRA Metals and TCLP Metals for Sauget Area One, Sauget, St. Clair County, Illinois

REF: Analytical TDD:T05-9405-803 Project TDD:T05-9405-006
Analytical PAN:EIL0836AAA Project PAN:EIL0836SAA

The data quality assurance review of 4 soil and 1 water samples collected from the site has been completed. Analyses for total RCRA metals and TCLP RCRA metals were performed by Twin City Testing Corporation (Huntingdon) of St. Paul, Minnesota in accordance with USEPA SW-846 Methods 1311 and 6010. Mercury was analyzed following SW-846 Method 7471. The water sample (GS-D2W-105) was not analyzed for TCLP metals.

The sample was numbered in the field as follows. The corresponding laboratory identification numbers are provided:

TAT Sample # corresponds to - >	Laboratory Sample #
GS-C304-101	25147
GS-C4-102	25150
GS-C6-103	25152
GS-B6-104	25154
GS-D2W-105	25155

Data Qualifications:

I. **Holding Time:** Acceptable

The samples were collected on 5/27/94 and analyzed on 6/10/94 for total metals (6/17/94 for mercury). The water sample was analyzed on 6/17/94 for total metals. TCLP analyses were performed between 6/14/94 to 6/17/94. The holding time criteria of 6 months (28 days for mercury) from collection to analysis was satisfied.

II. **Calibration:**

A. Initial Calibration: Acceptable

Recoveries for the initial calibration verification analysis were within 90-110 % (80-120 % for mercury), as required.

B. Continuing Calibration: Acceptable

Recoveries of the continuing calibration analyses were within 90-110% (80-120% for mercury), as required.

IV. **Method Blank:** Acceptable

A method blank was analyzed for each matrix analyzed. No target analytes or contaminants were detected above the detection limit.

V. **Interference Check Sample Analysis:** Acceptable

All interference check analytes were recovered within established limits.

VI. **Matrix Spike/Matrix Spike Duplicate:** Acceptable

The recoveries of the MS/MSD were slightly low for 3 metals (cadmium 75%, chromium 72%, and silver 78%). The relative percent difference between the MS/MSD were within 20% difference.

VIII. **Overall Assessment of Data For Use:**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-01 April, 1990). Based upon the information provided, the data are acceptable for use.

Huntingdon

TOTAL METAL RESULTS

(All values are in mg/Kg which is equal to parts-per-million)

Client ID:	GS-C3D4-101	GS-C4-102	GS-C6-103	GS-B6-104			
TCT ID:	25147	25150	25152	25154			
Parameter					PQL	Test Date	Test Method
Arsenic	45	55	8.6	ND	5.0	6/10/94	6010
Barium	1,100	3,300	330	11,000	0.50	6/10/94	6010
Cadmium	6.4	4.7	6.1	25	0.50	6/10/94	6010
Chromium	43	140	16	58	0.50	6/10/94	6010
Lead	450	450	210	1,200	2.5	6/10/94	6010
Mercury	3.0	2.0	0.83	1.8	0.20	6/17/94	7471
Selenium	ND	ND	ND	ND	5.0	6/10/94	6010
Silver	1.4	ND	2.6	6.5	0.50	6/10/94	6010

All results are reported on a dry weight basis.

ND = Not Detected

PQL = Practical Quantitation Limit

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November, 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

Huntingdon

TOTAL METAL RESULTS

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID: GS-105

TCT ID:	25155	25155MS	25155MSD			
Parameter				**PQL**	**Test Date**	**Test Method**
Arsenic	ND	100% Rec	2.5 RPD	5.0	6/17/94	6010
Barium	110	100% Rec	1.4 RPD	0.50	6/17/94	6010
Cadmium	ND	99% Rec	< 1 RPD	0.50	6/17/94	6010
Chromium	ND	102% Rec	< 1 RPD	0.50	6/17/94	6010
Lead	ND	100% Rec	< 1 RPD	2.5	6/17/94	6010
Mercury	ND	110% Rec	7.0 RPD	0.20	6/17/94	7471
Selenium	ND	103% Rec	2.6 RPD	5.0	6/17/94	6010
Silver	ND	97% Rec	26 RPD	0.50	6/17/94	6010

All results are reported on a dry weight basis.

ND = Not Detected

PQL = Practical Quantitation Limit

Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November, 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

Huntingdon

TCLP METAL RESULTS

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	GS-C3D4-101	GS-C4-102	GS-C6-103			
TCT ID:	25147	25150	25152			
Parameter				PQL	Test Date	Test Method
Arsenic	ND	ND	ND	100	6/14/94	6010
Barium	170	580	970	10	6/14/94	6010
Cadmium	50	47	25	10	6/14/94	6010
Chromium	11	29	ND	10	6/14/94	6010
Lead	57	110	76	50	6/14/94	6010
Mercury	ND	ND	ND	0.40	6/16/94	7471
Selenium	ND	ND	ND	100	6/14/94	6010
Silver	ND	ND	ND	10	6/15/94	6010

ND = Not Detected

PQL = Practical Quantitation Limit

Reference: EPA Test Methods for Evaluating Solid Wastes, SW-846, November 1986, 3rd Edition.

Federal Register, Volume 55, Number 126, June 1990, 40CFR, Method 1311.

LABORATORY NO: 4416-94-5037

Huntingdon

TCLP METAL RESULTS

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID: **GS-B6-104**

TCT ID: 25154

Parameter		PQL	Test Date	Test Method
Arsenic	ND	100	6/14/94	6010
Barium	4,700	10	6/24/94	6010
Cadmium	ND	10	6/14/94	6010
Chromium	ND	10	6/14/94	6010
Lead	53	50	6/14/94	6010
Mercury	ND	0.40	6/16/94	7471
Selenium	ND	100	6/14/94	6010
Silver	ND	10	6/15/94	6010

ND = Not Detected

PQL = Practical Quantitation Limit

Reference: EPA Test Methods for Evaluating Solid Wastes, SW-846, November 1986, 3rd Edition.

Federal Register, Volume 55, Number 126, June 1990, 40CFR, Method 1311.

LABORATORY NO: 4416-94-5037

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M E M O R A N D U M

DATE: July 7, 1994

TO: Steven Skare, Project Manager, E & E, Chicago, IL

FROM: David Hendren, TAT-Chemist, E & E, Chicago, IL

THRU: Pat Zwilling, ATATL, E & E, Chicago, IL

SUBJ: **Semi-Volatile Organic Data Quality Assurance Review for Sauget Area One, Sauget, St. Clair County, Illinois**

REF: Analytical TDD:T05-9405-803 Project TDD:T05-9405-006
Analytical PAN:EIL0836AAA Project PAN:EIL0836SAA

The data quality assurance review of 4 soil and 1 water samples collected from the site has been completed. Analyses for total Semivolatile Organics (SVOA) and TCLP SVOA were performed by Twin City Testing Corporation (Huntingdon) of St. Paul, Minnesota in accordance with USEPA SW-846 Methods 1311 and 8270. Only the soil samples were subjected to the TCLP analyses.

The samples were numbered in the field as follows. The corresponding laboratory identification numbers are provided:

TAT Sample #	corresponds to - >	Laboratory Sample #
GS-C304-101		25147
GS-C4-102		25150DL
GS-C6-103		25152
GS-B6-104		25154
GS-D2W-105		25155

Data Qualifications:

I. **Holding Time:** Acceptable

The samples were collected on 5/27/94, extracted for analysis on 6/9/94 and 6/10/94 and analyzed on 6/12/94 and

6/13/94. The water sample (GS-D2W-105) was extracted on 6/3/94 and analyzed on 6/9/94. The TCLP extraction was performed on 6/2/94 and leachates were analyzed on 6/6/94 and 6/7/94. The holding time criteria of 14 days from collection to extraction was satisfied. Extracts were analyzed within 40 days following extraction.

II. **GC/MS Tuning:** Acceptable

GC/MS tuning to meet ion abundance criteria using decafluorotriphenylphosphine (DFTPP) were acceptable and samples were analyzed within 12 hours of DFTPP tuning.

III. **Calibration:**

A. Initial Calibration: Acceptable

A 5-point initial calibration was performed prior to analysis. All average relative response factors were greater than 0.05. The percent relative standard deviations (%RSD) between response factors were less than 30% for all detected target analytes.

B. Continuing Calibration: Acceptable

The percent difference (%D) between initial and continuing calibration for SVOA compounds were within the quality control criteria of less than or equal to 25% for all detected target analytes.

IV. **Method Blank:** Acceptable

A method blank was analyzed for each matrix analyzed. No target analytes or contaminants were detected above the detection limit.

V. **Surrogate Recovery:** Acceptable

Recoveries of the surrogate terphenyl-D14 was elevated in samples 25152 and 25154 for total SVOA. All other surrogates were recovered within established limits.

VI. **Matrix Spike/Matrix Spike Duplicate:** Acceptable

The recoveries of the MS/MSD were within established quality control limits.

VII. **Internal Standards:** Acceptable

The established quality control criteria for the internal standards area counts of -50% to +100% from the associated calibration standard was exceeded (low recoveries) for chrysene-D12 and perylene-D12 in samples 25147, 25152, and 25154. These samples were reinjected and produced the same reults, showing

that matrix interferences probably were responsible for the low recoveries. Qualification was not judged to be necessary.

VIII. Overall Assessment of Data For Use:

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-01 April, 1990). Based upon the information provided, the data are acceptable for use.

EPA METHOD 8270 **Huntingdon**
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID:	GS-C304-101	Lab ID (HSN):	25147
Matrix:	SOIL	Filename:	4163P06
Date Sampled:	05/27/94	Sample Size:	1 grams
Date Received:	05/31/94	Extract Vol.:	500 uL
Date Extracted:	06/09/94	Dil. Factor:	1
Date Analyzed:	06/12/94	GPC Factor:	2
		% Moisture:	20.6

Compounds:	ug/Kg (PPB)	EQL
Phenol	3300 J	13000
bis(2-Chloroethyl)ether	13000 U	13000
2-Chlorophenol	13000 U	13000
1,3-Dichlorobenzene	13000 U	13000
1,4-Dichlorobenzene	13000 U	13000
1,2-Dichlorobenzene	13000 U	13000
2-Methylphenol	13000 U	13000
2,2'-oxybis(1-Chloropropane)	13000 U	13000
4-Methylphenol	13000 U	13000
N-Nitroso-di-n-propylamine	13000 U	13000
Hexachloroethane	13000 U	13000
Nitrobenzene	13000 U	13000
Isophorone	13000 U	13000
2-Nitrophenol	13000 U	13000
2,4-Dimethylphenol	13000 U	13000
bis(2-Chloroethoxy)methane	13000 U	13000
2,4-Dichlorophenol	13000 U	13000
1,2,4-Trichlorobenzene	13000 U	13000
Naphthalene	6000 J	13000
4-Chloroaniline	13000 U	13000
Hexachlorobutadiene	13000 U	13000
4-Chloro-3-methylphenol	13000 U	13000
2-Methylnaphthalene	13000 U	13000
Hexachlorocyclopentadiene	13000 U	13000
2,4,6-Trichlorophenol	13000 U	13000
2,4,5-Trichlorophenol	31000 U	31000
2-Chloronaphthalene	13000 U	13000
2-Nitroaniline	31000 U	31000
Dimethylphthalate	13000 U	13000
Acenaphthylene	13000 U	13000
2,6-Dinitrotoluene	13000 U	13000
3-Nitroaniline	31000 U	31000
Acenaphthene	13000 U	13000
2,4-Dinitrophenol	31000 U	31000
4-Nitrophenol	31000 U	31000
Dibenzofuran	13000 U	13000
2,4-Dinitrotoluene	13000 U	13000
Diethylphthalate	13000 U	13000
4-Chlorophenyl-phenylether	13000 U	13000
Fluorene	13000 U	13000
4-Nitroaniline	31000 U	31000
4,6-Dinitro-2-methylphenol	31000 U	31000

(continued)

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID: GS-C304-101 Lab ID (HSN): 25147
Matrix: SOIL Filename: 4163P06

Compounds:	ug/Kg (PPB)		EQL
N-Nitrosodiphenylamine	13000 U		13000
4-Bromophenyl-phenylether	13000 U		13000
Hexachlorobenzene	13000 U		13000
Pentachlorophenol	2800 J		31000
Phenanthrene	13000 U		13000
Anthracene	13000 U		13000
Carbazole	13000 U		13000
Di-n-butylphthalate	13000 U		13000
Fluoranthene	13000 U		13000
Pyrene	13000 U	Y	13000
Butylbenzylphthalate	13000 U	Y	13000
3,3'-Dichlorobenzidine	13000 U	Y	13000
Benz(a)anthracene	13000 U	Y	13000
Chrysene	13000 U	Y	13000
bis(2-Ethylhexyl)phthalate	13000 U	Y	13000
Di-n-octylphthalate	13000 U	Y	13000
Benzo(b)fluoranthene	13000 U	Y	13000
Benzo(k)fluoranthene	13000 U	Y	13000
Benzo(a)pyrene	13000 U	Y	13000
Indeno(1,2,3-cd)pyrene	13000 U	Y	13000
Dibenz(a,h)anthracene	13000 U	Y	13000
Benzo(g,h,i)perylene	13000 U	Y	13000

Surrogate Recovery			QC LIMITS
2-Fluorophenol	69%		25-121%
Phenol-d5	77%		24-113%
2-Chlorophenol-d4	72%		20-130%
1,2-Dichlorobenzene-d4	64%		20-130%
Nitrobenzene-d5	69%		23-120%
2-Fluorobiphenyl	90%		30-115%
2,4,6-Tribromophenol	70%		19-122%
Terphenyl-d14	136%	Y	18-137%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5037

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID:	GS-C4-102	Lab ID (HSN):	25150DL
Matrix:	SOIL	Filename:	4164P06
Date Sampled:	05/27/94	Sample Size:	1 grams
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/10/94	Dil. Factor:	5
Date Analyzed:	06/13/94	GPC Factor:	2
		% Moisture:	6.6

Compounds:	ug/Kg (PPB)		EQL
Phenol	110000	UD	110000
bis(2-Chloroethyl)ether	110000	UD	110000
2-Chlorophenol	110000	UD	110000
1,3-Dichlorobenzene	110000	UD	110000
1,4-Dichlorobenzene	110000	UD	110000
1,2-Dichlorobenzene	110000	UD	110000
2-Methylphenol	110000	UD	110000
2,2'-oxybis(1-Chloropropane)	110000	UD	110000
4-Methylphenol	110000	UD	110000
N-Nitroso-di-n-propylamine	110000	UD	110000
Hexachloroethane	110000	UD	110000
Nitrobenzene	110000	UD	110000
Isophorone	110000	UD	110000
2-Nitrophenol	110000	UD	110000
2,4-Dimethylphenol	110000	UD	110000
bis(2-Chloroethoxy)methane	110000	UD	110000
2,4-Dichlorophenol	110000	UD	110000
1,2,4-Trichlorobenzene	110000	UD	110000
Naphthalene	400000	D	110000
4-Chloroaniline	110000	UD	110000
Hexachlorobutadiene	110000	UD	110000
4-Chloro-3-methylphenol	110000	UD	110000
2-Methylnaphthalene	110000	UD	110000
Hexachlorocyclopentadiene	110000	UD	110000
2,4,6-Trichlorophenol	110000	UD	110000
2,4,5-Trichlorophenol	270000	UD	270000
2-Chloronaphthalene	110000	UD	110000
2-Nitroaniline	270000	UD	270000
Dimethylphthalate	110000	UD	110000
Acenaphthylene	110000	UD	110000
2,6-Dinitrotoluene	110000	UD	110000
3-Nitroaniline	270000	UD	270000
Acenaphthene	110000	UD	110000
2,4-Dinitrophenol	270000	UD	270000
4-Nitrophenol	270000	UD	270000
Dibenzofuran	110000	UD	110000
2,4-Dinitrotoluene	110000	UD	110000
Diethylphthalate	110000	UD	110000
4-Chlorophenyl-phenylether	110000	UD	110000
Fluorene	110000	UD	110000
4-Nitroaniline	270000	UD	270000
4,6-Dinitro-2-methylphenol	270000	UD	270000

(continued)

EPA METHOD 8270 **Huntingdon**
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID: GS-C4-102 Lab ID (HSN): 25150DL
Matrix: SOIL Filename: 4164P06

Compounds:	ug/Kg (PPB)	EQL
N-Nitrosodiphenylamine	110000 UD	110000
4-Bromophenyl-phenylether	110000 UD	110000
Hexachlorobenzene	110000 UD	110000
Pentachlorophenol	270000 UD	270000
Phenanthrene	37000 JD	110000
Anthracene	110000 UD	110000
Carbazole	110000 UD	110000
Di-n-butylphthalate	110000 UD	110000
Fluoranthene	110000 UD	110000
Pyrene	110000 UD	110000
Butylbenzylphthalate	110000 UD	110000
3,3'-Dichlorobenzidine	110000 UD	110000
Benz(a)anthracene	110000 UD	110000
Chrysene	26000 JD	110000
bis(2-Ethylhexyl)phthalate	110000 UD	110000
Di-n-octylphthalate	110000 UD	110000
Benzo(b)fluoranthene	110000 UD	110000
Benzo(k)fluoranthene	110000 UD	110000
Benzo(a)pyrene	110000 UD	110000
Indeno(1,2,3-cd)pyrene	110000 UD	110000
Dibenz(a,h)anthracene	110000 UD	110000
Benzo(g,h,i)perylene	110000 UD	110000

Surrogate Recovery		QC LIMITS
2-Fluorophenol	82%JD	25-121%
Phenol-d5	84%JD	24-113%
2-Chlorophenol-d4	83%JD	20-130%
1,2-Dichlorobenzene-d4	80%JD	20-130%
Nitrobenzene-d5	73%JD	23-120%
2-Fluorobiphenyl	85%JD	30-115%
2,4,6-Tribromophenol	95%JD	19-122%
Terphenyl-d14	109%JD	18-137%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor

Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5037

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID:	GS-C6-103	Lab ID (HSN):	25152
Matrix:	SOIL	Filename:	4163P14
Date Sampled:	05/27/94	Sample Size:	1 grams
Date Received:	05/31/94	Extract Vol.:	500 uL
Date Extracted:	06/09/94	Dil. Factor:	10
Date Analyzed:	06/13/94	GPC Factor:	2
		% Moisture:	19.4

Compounds:	ug/Kg (PPB)		EQL
Phenol	120000	UD	120000
bis(2-Chloroethyl)ether	120000	UD	120000
2-Chlorophenol	120000	UD	120000
1,3-Dichlorobenzene	120000	UD	120000
1,4-Dichlorobenzene	120000	UD	120000
1,2-Dichlorobenzene	120000	UD	120000
2-Methylphenol	120000	UD	120000
2,2'-oxybis(1-Chloropropane)	120000	UD	120000
4-Methylphenol	120000	UD	120000
N-Nitroso-di-n-propylamine	120000	UD	120000
Hexachloroethane	120000	UD	120000
Nitrobenzene	120000	UD	120000
Isophorone	120000	UD	120000
2-Nitrophenol	120000	UD	120000
2,4-Dimethylphenol	120000	UD	120000
bis(2-Chloroethoxy)methane	120000	UD	120000
2,4-Dichlorophenol	120000	UD	120000
1,2,4-Trichlorobenzene	120000	UD	120000
Naphthalene	170000	D	120000
4-Chloroaniline	120000	UD	120000
Hexachlorobutadiene	120000	UD	120000
4-Chloro-3-methylphenol	120000	UD	120000
2-Methylnaphthalene	14000	JD	120000
Hexachlorocyclopentadiene	120000	UD	120000
2,4,6-Trichlorophenol	120000	UD	120000
2,4,5-Trichlorophenol	310000	UD	310000
2-Chloronaphthalene	120000	UD	120000
2-Nitroaniline	310000	UD	310000
Dimethylphthalate	120000	UD	120000
Acenaphthylene	120000	UD	120000
2,6-Dinitrotoluene	120000	UD	120000
3-Nitroaniline	310000	UD	310000
Acenaphthene	120000	UD	120000
2,4-Dinitrophenol	310000	UD	310000
4-Nitrophenol	310000	UD	310000
Dibenzofuran	120000	UD	120000
2,4-Dinitrotoluene	120000	UD	120000
Diethylphthalate	120000	UD	120000
4-Chlorophenyl-phenylether	120000	UD	120000
Fluorene	120000	UD	120000
4-Nitroaniline	310000	UD	310000
4,6-Dinitro-2-methylphenol	310000	UD	310000

(continued)

EPA METHOD 8270 **Huntingdon**
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID: GS-C6-103 Lab ID (HSN): 25152
Matrix: SOIL Filename: 4163P14

Compounds:	ug/Kg (PPB)			EQL
N-Nitrosodiphenylamine	120000	UD		120000
4-Bromophenyl-phenylether	120000	UD		120000
Hexachlorobenzene	120000	UD		120000
Pentachlorophenol	310000	UD		310000
Phenanthrene	78000	JD		120000
Anthracene	120000	UD		120000
Carbazole	120000	UD		120000
Di-n-butylphthalate	120000	UD		120000
Fluoranthene	17000	JD		120000
Pyrene	180000	D	Y	120000
Butylbenzylphthalate	120000	UD	Y	120000
3,3'-Dichlorobenzidine	120000	UD	Y	120000
Benz(a)anthracene	40000	JD	Y	120000
Chrysene	110000	JD	Y	120000
bis(2-Ethylhexyl)phthalate	120000	UD	Y	120000
Di-n-octylphthalate	120000	UD	Y	120000
Benzo(b)fluoranthene	24000	JD	Y	120000
Benzo(k)fluoranthene	120000	UD	Y	120000
Benzo(a)pyrene	25000	JD	Y	120000
Indeno(1,2,3-cd)pyrene	120000	UD	Y	120000
Dibenz(a,h)anthracene	120000	UD	Y	120000
Benzo(g,h,i)perylene	120000	UD	Y	120000

Surrogate Recovery			QC LIMITS
2-Fluorophenol	86%JD		25-121%
Phenol-d5	95%JD		24-113%
2-Chlorophenol-d4	89%JD		20-130%
1,2-Dichlorobenzene-d4	88%JD		20-130%
Nitrobenzene-d5	90%JD		23-120%
2-Fluorobiphenyl	107%JD		30-115%
2,4,6-Tribromophenol	73%JD		19-122%
Terphenyl-d14	150%JD	Y	18-137%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor
Y = Associated internal standard failed method criteria
Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5037

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID:	GS-C6-103	Lab ID (HSN):	25152RI
Matrix:	SOIL	Filename:	4164P08
Date Sampled:	05/27/94	Sample Size:	1 grams
Date Received:	05/31/94	Extract Vol.:	500 uL
Date Extracted:	06/09/94	Dil. Factor:	10
Date Analyzed:	06/13/94	GPC Factor:	2
		% Moisture:	19.4

Compounds:	ug/Kg (PPB)		EQL
Phenol	120000	UD	120000
bis(2-Chloroethyl)ether	120000	UD	120000
2-Chlorophenol	120000	UD	120000
1,3-Dichlorobenzene	120000	UD	120000
1,4-Dichlorobenzene	120000	UD	120000
1,2-Dichlorobenzene	120000	UD	120000
2-Methylphenol	120000	UD	120000
2,2'-oxybis(1-Chloropropane)	120000	UD	120000
4-Methylphenol	120000	UD	120000
N-Nitroso-di-n-propylamine	120000	UD	120000
Hexachloroethane	120000	UD	120000
Nitrobenzene	120000	UD	120000
Isophorone	120000	UD	120000
2-Nitrophenol	120000	UD	120000
2,4-Dimethylphenol	120000	UD	120000
bis(2-Chloroethoxy)methane	120000	UD	120000
2,4-Dichlorophenol	120000	UD	120000
1,2,4-Trichlorobenzene	120000	UD	120000
Naphthalene	170000	D	120000
4-Chloroaniline	120000	UD	120000
Hexachlorobutadiene	120000	UD	120000
4-Chloro-3-methylphenol	120000	UD	120000
2-Methylnaphthalene	15000	JD	120000
Hexachlorocyclopentadiene	120000	UD	120000
2,4,6-Trichlorophenol	120000	UD	120000
2,4,5-Trichlorophenol	310000	UD	310000
2-Chloronaphthalene	120000	UD	120000
2-Nitroaniline	310000	UD	310000
Dimethylphthalate	120000	UD	120000
Acenaphthylene	120000	UD	120000
2,6-Dinitrotoluene	120000	UD	120000
3-Nitroaniline	310000	UD	310000
Acenaphthene	120000	UD	120000
2,4-Dinitrophenol	310000	UD	310000
4-Nitrophenol	310000	UD	310000
Dibenzofuran	120000	UD	120000
2,4-Dinitrotoluene	120000	UD	120000
Diethylphthalate	120000	UD	120000
4-Chlorophenyl-phenylether	120000	UD	120000
Fluorene	120000	UD	120000
4-Nitroaniline	310000	UD	310000
4,6-Dinitro-2-methylphenol	310000	UD	310000

(continued)

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID: GS-C6-103 Lab ID (HSN): 25152RI
Matrix: SOIL Filename: 4164P08

Compounds:	ug/Kg (PPB)			EQL
N-Nitrosodiphenylamine	120000	UD		120000
4-Bromophenyl-phenylether	120000	UD		120000
Hexachlorobenzene	120000	UD		120000
Pentachlorophenol	310000	UD		310000
Phenanthrene	76000	JD		120000
Anthracene	120000	UD		120000
Carbazole	120000	UD		120000
Di-n-butylphthalate	120000	UD		120000
Fluoranthene	20000	JD		120000
Pyrene	180000	D	Y	120000
Butylbenzylphthalate	120000	UD	Y	120000
3,3'-Dichlorobenzidine	120000	UD	Y	120000
Benz(a)anthracene	45000	JD	Y	120000
Chrysene	110000	JD	Y	120000
bis(2-Ethylhexyl)phthalate	24000	JDB	Y	120000
Di-n-octylphthalate	120000	UD	Y	120000
Benzo(b)fluoranthene	25000	JD	Y	120000
Benzo(k)fluoranthene	120000	UD	Y	120000
Benzo(a)pyrene	24000	JD	Y	120000
Indeno(1,2,3-cd)pyrene	120000	UD	Y	120000
Dibenz(a,h)anthracene	120000	UD	Y	120000
Benzo(g,h,i)perylene	46000	JD	Y	120000

Surrogate Recovery			QC LIMITS
2-Fluorophenol	86%JD		25-121%
Phenol-d5	90%JD		24-113%
2-Chlorophenol-d4	93%JD		20-130%
1,2-Dichlorobenzene-d4	88%JD		20-130%
Nitrobenzene-d5	82%JD		23-120%
2-Fluorobiphenyl	101%JD		30-115%
2,4,6-Tribromophenol	81%JD		19-122%
Terphenyl-d14	158%JD	Y	18-137%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor
Y = Associated internal standard failed method criteria
Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

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EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID:	GS-B6-104	Lab ID (HSN):	25154
Matrix:	SOIL	Filename:	4163P15
Date Sampled:	05/27/94	Sample Size:	1 grams
Date Received:	05/31/94	Extract Vol.:	500 uL
Date Extracted:	06/09/94	Dil. Factor:	10
Date Analyzed:	06/13/94	GPC Factor:	2
		% Moisture:	83

Compounds:	ug/Kg (PPB)		EQL
Phenol	97000	JD	590000
bis(2-Chloroethyl)ether	590000	UD	590000
2-Chlorophenol	590000	UD	590000
1,3-Dichlorobenzene	590000	UD	590000
1,4-Dichlorobenzene	590000	UD	590000
1,2-Dichlorobenzene	590000	UD	590000
2-Methylphenol	590000	UD	590000
2,2'-oxybis(1-Chloropropane)	590000	UD	590000
4-Methylphenol	590000	UD	590000
N-Nitroso-di-n-propylamine	590000	UD	590000
Hexachloroethane	590000	UD	590000
Nitrobenzene	590000	UD	590000
Isophorone	590000	UD	590000
2-Nitrophenol	590000	UD	590000
2,4-Dimethylphenol	590000	UD	590000
bis(2-Chloroethoxy)methane	590000	UD	590000
2,4-Dichlorophenol	260000	JD	590000
1,2,4-Trichlorobenzene	590000	UD	590000
Naphthalene	5200000	ED	590000
4-Chloroaniline	1700000	D	590000
Hexachlorobutadiene	590000	UD	590000
4-Chloro-3-methylphenol	590000	UD	590000
2-Methylnaphthalene	130000	JD	590000
Hexachlorocyclopentadiene	590000	UD	590000
2,4,6-Trichlorophenol	200000	JD	590000
2,4,5-Trichlorophenol	1500000	UD	1500000
2-Chloronaphthalene	590000	UD	590000
2-Nitroaniline	1500000	UD	1500000
Dimethylphthalate	590000	UD	590000
Acenaphthylene	590000	UD	590000
2,6-Dinitrotoluene	590000	UD	590000
3-Nitroaniline	1500000	UD	1500000
Acenaphthene	590000	UD	590000
2,4-Dinitrophenol	1500000	UD	1500000
4-Nitrophenol	1500000	UD	1500000
Dibenzofuran	590000	UD	590000
2,4-Dinitrotoluene	590000	UD	590000
Diethylphthalate	590000	UD	590000
4-Chlorophenyl-phenylether	590000	UD	590000
Fluorene	590000	UD	590000
4-Nitroaniline	1500000	UD	1500000
4,6-Dinitro-2-methylphenol	1500000	UD	1500000

(continued)

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID: GS-B6-104 Lab ID (HSN): 25154
Matrix: SOIL Filename: 4163P15

Compounds:	ug/Kg (PPB)			EQL
N-Nitrosodiphenylamine	200000	JD		590000
4-Bromophenyl-phenylether	590000	UD		590000
Hexachlorobenzene	590000	UD		590000
Pentachlorophenol	280000	JD		1500000
Phenanthrene	340000	JD		590000
Anthracene	590000	UD		590000
Carbazole	590000	UD		590000
Di-n-butylphthalate	590000	UD		590000
Fluoranthene	74000	JD		590000
Pyrene	1000000	D	Y	590000
Butylbenzylphthalate	590000	UD	Y	590000
3,3'-Dichlorobenzidine	590000	UD	Y	590000
Benz(a)anthracene	440000	JD	Y	590000
Chrysene	1200000	D	Y	590000
bis(2-Ethylhexyl)phthalate	590000	UD	Y	590000
Di-n-octylphthalate	590000	UD	Y	590000
Benzo(b)fluoranthene	370000	JD	Y	590000
Benzo(k)fluoranthene	590000	UD	Y	590000
Benzo(a)pyrene	330000	JD	Y	590000
Indeno(1,2,3-cd)pyrene	590000	UD	Y	590000
Dibenz(a,h)anthracene	590000	UD	Y	590000
Benzo(g,h,i)perylene	310000	JD	Y	590000

Surrogate Recovery			QC LIMITS
2-Fluorophenol	75%JD		25-121%
Phenol-d5	87%JD		24-113%
2-Chlorophenol-d4	81%JD		20-130%
1,2-Dichlorobenzene-d4	74%JD		20-130%
Nitrobenzene-d5	78%JD		23-120%
2-Fluorobiphenyl	94%JD		30-115%
2,4,6-Tribromophenol	65%JD		19-122%
Terphenyl-d14	176%JD	Y	18-137%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor
Y = Associated internal standard failed method criteria
Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

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EPA METHOD 8270 **Huntingdon**
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID:	GS-B6-104	Lab ID (HSN):	25154DL
Matrix:	SOIL	Filename:	4164P07
Date Sampled:	05/27/94	Sample Size:	1 grams
Date Received:	05/27/94	Extract Vol.:	500 uL
Date Extracted:	06/09/94	Dil. Factor:	40
Date Analyzed:	06/13/94	GPC Factor:	2
		% Moisture:	83

Compounds:	ug/Kg (PPB)		EQL
Phenol	2400000	UD	2400000
bis(2-Chloroethyl)ether	2400000	UD	2400000
2-Chlorophenol	2400000	UD	2400000
1,3-Dichlorobenzene	2400000	UD	2400000
1,4-Dichlorobenzene	2400000	UD	2400000
1,2-Dichlorobenzene	2400000	UD	2400000
2-Methylphenol	2400000	UD	2400000
2,2'-oxybis(1-Chloropropane)	2400000	UD	2400000
4-Methylphenol	2400000	UD	2400000
N-Nitroso-di-n-propylamine	2400000	UD	2400000
Hexachloroethane	2400000	UD	2400000
Nitrobenzene	2400000	UD	2400000
Isophorone	2400000	UD	2400000
2-Nitrophenol	2400000	UD	2400000
2,4-Dimethylphenol	2400000	UD	2400000
bis(2-Chloroethoxy)methane	2400000	UD	2400000
2,4-Dichlorophenol	250000	JD	2400000
1,2,4-Trichlorobenzene	2400000	UD	2400000
Naphthalene	7000000	D	2400000
4-Chloroaniline	1100000	JD	2400000
Hexachlorobutadiene	2400000	UD	2400000
4-Chloro-3-methylphenol	2400000	UD	2400000
2-Methylnaphthalene	2400000	UD	2400000
Hexachlorocyclopentadiene	2400000	UD	2400000
2,4,6-Trichlorophenol	2400000	UD	2400000
2,4,5-Trichlorophenol	5900000	UD	5900000
2-Chloronaphthalene	2400000	UD	2400000
2-Nitroaniline	5900000	UD	5900000
Dimethylphthalate	2400000	UD	2400000
Acenaphthylene	2400000	UD	2400000
2,6-Dinitrotoluene	2400000	UD	2400000
3-Nitroaniline	5900000	UD	5900000
Acenaphthene	2400000	UD	2400000
2,4-Dinitrophenol	5900000	UD	5900000
4-Nitrophenol	5900000	UD	5900000
Dibenzofuran	2400000	UD	2400000
2,4-Dinitrotoluene	2400000	UD	2400000
Diethylphthalate	2400000	UD	2400000
4-Chlorophenyl-phenylether	2400000	UD	2400000
Fluorene	2400000	UD	2400000
4-Nitroaniline	5900000	UD	5900000
4,6-Dinitro-2-methylphenol	5900000	UD	5900000

(continued)

EPA METHOD 8270
TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID: GS-B6-104 Lab ID (HSN): 25154DL
Matrix: SOIL Filename: 4164P07

Compounds:	ug/Kg (PPB)	EQL
N-Nitrosodiphenylamine	2400000 UD	2400000
4-Bromophenyl-phenylether	2400000 UD	2400000
Hexachlorobenzene	2400000 UD	2400000
Pentachlorophenol	5900000 UD	5900000
Phenanthrene	340000 JD	2400000
Anthracene	2400000 UD	2400000
Carbazole	2400000 UD	2400000
Di-n-butylphthalate	2400000 UD	2400000
Fluoranthene	2400000 UD	2400000
Pyrene	730000 JD	2400000
Butylbenzylphthalate	2400000 UD	2400000
3,3'-Dichlorobenzidine	2400000 UD	2400000
Benz(a)anthracene	440000 JD	2400000
Chrysene	1300000 JD	2400000
bis(2-Ethylhexyl)phthalate	2400000 UD	2400000
Di-n-octylphthalate	2400000 UD	2400000
Benzo(b)fluoranthene	420000 JD	2400000
Benzo(k)fluoranthene	2400000 UD	2400000
Benzo(a)pyrene	350000 JD	2400000
Indeno(1,2,3-cd)pyrene	2400000 UD	2400000
Dibenz(a,h)anthracene	2400000 UD	2400000
Benzo(g,h,i)perylene	360000 JD	2400000

Surrogate Recovery		QC LIMITS
2-Fluorophenol	75%JD	25-121%
Phenol-d5	83%JD	24-113%
2-Chlorophenol-d4	80%JD	20-130%
1,2-Dichlorobenzene-d4	76%JD	20-130%
Nitrobenzene-d5	72%JD	23-120%
2-Fluorobiphenyl	88%JD	30-115%
2,4,6-Tribromophenol	75%JD	19-122%
Terphenyl-d14	136%JD	18-137%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor

Note: All results are reported on a dry weight basis.
Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5037

TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8270

Huntingdon

Client ID:	GS-D2W-105	Lab ID (HSN):	25155
Matrix:	WATER	Filename:	4160P13
Date Sampled:	05/27/94	Sample Size:	375 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/03/94	Dil. Factor:	1
Date Analyzed:	06/09/94		

Compounds:	ug/L (PPB)	EQL
Phenol	27 U	27
bis(2-Chloroethyl)ether	27 U	27
2-Chlorophenol	27 U	27
1,3-Dichlorobenzene	27 U	27
1,4-Dichlorobenzene	27 U	27
1,2-Dichlorobenzene	27 U	27
2-Methylphenol	27 U	27
2,2'-oxybis(1-Chloropropane)	27 U	27
4-Methylphenol	27 U	27
N-Nitroso-di-n-propylamine	27 U	27
Hexachloroethane	27 U	27
Nitrobenzene	27 U	27
Isophorone	27 U	27
2-Nitrophenol	27 U	27
2,4-Dimethylphenol	27 U	27
bis(2-Chloroethoxy)methane	27 U	27
2,4-Dichlorophenol	27 U	27
1,2,4-Trichlorobenzene	27 U	27
Naphthalene	27 U	27
4-Chloroaniline	27 U	27
Hexachlorobutadiene	27 U	27
4-Chloro-3-methylphenol	27 U	27
2-Methylnaphthalene	27 U	27
Hexachlorocyclopentadiene	27 U	27
2,4,6-Trichlorophenol	27 U	27
2,4,5-Trichlorophenol	67 U	67
2-Chloronaphthalene	27 U	27
2-Nitroaniline	8.4 J	67
Dimethylphthalate	27 U	27
Acenaphthylene	27 U	27
2,6-Dinitrotoluene	27 U	27
3-Nitroaniline	67 U	67
Acenaphthene	27 U	27
2,4-Dinitrophenol	67 U	67
4-Nitrophenol	67 U	67
Dibenzofuran	27 U	27
2,4-Dinitrotoluene	27 U	27
Diethylphthalate	27 U	27
4-Chlorophenyl-phenylether	27 U	27
Fluorene	27 U	27
4-Nitroaniline	67 U	67
4,6-Dinitro-2-methylphenol	67 U	67

(continued)

TCL SEMIVOLATILE ORGANIC COMPOUND RESULTS [illegible]
EPA METHOD 8270

Huntingdon

Client ID: GS-D2W-105 Lab ID (HSN): 25155
Matrix: WATER Filename: 4160P13

Compounds:	ug/L (PPB)	EQL
N-Nitrosodiphenylamine	27 U	27
4-Bromophenyl-phenylether	27 U	27
Hexachlorobenzene	27 U	27
Pentachlorophenol	67 U	67
Phenanthrene	27 U	27
Anthracene	27 U	27
Carbazole	27 U	27
Di-n-butylphthalate	27 U	27
Fluoranthene	27 U	27
Pyrene	27 U	27
Butylbenzylphthalate	27 U	27
3,3'-Dichlorobenzidine	27 U	27
Benz(a)anthracene	27 U	27
Chrysene	27 U	27
bis(2-Ethylhexyl)phthalate	13 J	27
Di-n-octylphthalate	27 U	27
Benzo(b)fluoranthene	27 U	27
Benzo(k)fluoranthene	27 U	27
Benzo(a)pyrene	27 U	27
Indeno(1,2,3-cd)pyrene	27 U	27
Dibenz(a,h)anthracene	27 U	27
Benzo(g,h,i)perylene	27 U	27

Surrogate Recovery		QC LIMITS
2-Fluorophenol	57%	21-110%
Phenol-d5	50%	10-110%
2-Chlorophenol-d4	64%	33-110%
Nitrobenzene-d5	61%	35-114%
2-Fluorobiphenyl	60%	43-116%
2,4,6-Tribromophenol	79%	10-123%
Terphenyl-d14	82%	33-141%

TCL = Target Coumpound List EPA Contract Laboratory Program (OLM01)
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN: 5037

EPA METHOD 8270 **Huntingdon**
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID:	GS-C304-101	Lab ID (HSN):	GS-C304-101
Matrix:	LEACH	Filename:	4157K15
Date Sampled:	05/27/94	Sample Size:	200 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/05/94	Dil. Factor:	1
Date Analyzed:	06/06/94		
Date Leached:	06/02/94		

Compounds:	ug/L (PPB)	EQL
Pyridine	50 U	50
1,4-Dichlorobenzene	50 U	50
o-Cresol	50 U	50
m- and/or p-Cresol	50 U	50
Hexachloroethane	50 U	50
Nitrobenzene	50 U	50
Hexachloro-1,3-butadiene	50 U	50
2,4,6-Trichlorophenol	50 U	50
2,4,5-Trichlorophenol	130 U	130
2,4-Dinitrotoluene	50 U	50
Hexachlorobenzene	50 U	50
Pentachlorophenol	130 U	130

Surrogate Recovery		QC LIMITS
2-Fluorophenol	48%	21-110%
Phenol-d5	31%	10-110%
2-Chlorophenol-d4	75%	33-110%
Nitrobenzene-d5	92%	35-114%
2-Fluorobiphenyl	70%	43-116%
2,4,6-Tribromophenol	96%	10-123%
Terphenyl-d14	136%	33-141%

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

EPA METHOD 8270 **Huntingdon**
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID:	GS-C4-102	Lab ID (HSN):	GS-C4-102
Matrix:	LEACH	Filename:	4157K19
Date Sampled:	05/27/94	Sample Size:	200 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/05/94	Dil. Factor:	1
Date Analyzed:	06/06/94		
Date Leached:	06/02/94		

Compounds:	ug/L (PPB)	EQL
Pyridine	50 U	50
1,4-Dichlorobenzene	50 U	50
o-Cresol	5 J	50
m- and/or p-Cresol	320	50
Hexachloroethane	50 U	50
Nitrobenzene	50 U	50
Hexachloro-1,3-butadiene	50 U	50
2,4,6-Trichlorophenol	50 U	50
2,4,5-Trichlorophenol	130 U	130
2,4-Dinitrotoluene	50 U	50
Hexachlorobenzene	50 U	50
Pentachlorophenol	130 U	130

Surrogate Recovery		QC LIMITS
2-Fluorophenol	43%	21-110%
Phenol-d5	32%	10-110%
2-Chlorophenol-d4	69%	33-110%
Nitrobenzene-d5	91%	35-114%
2-Fluorobiphenyl	89%	43-116%
2,4,6-Tribromophenol	134%E	10-123%
Terphenyl-d14	195%E	Y 33-141%

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

EPA METHOD 8270
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID:	GS-C4-102 RI	Lab ID (HSN):	GS-C4-102 RI
Matrix:	LEACH	Filename:	4158K04
Date Sampled:	05/27/94	Sample Size:	200 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/05/94	Dil. Factor:	1
Date Analyzed:	06/07/94		
Date Leached:	06/02/94		

Compounds:	ug/L (PPB)	EQL
Pyridine	50 U	50
1,4-Dichlorobenzene	50 U	50
o-Cresol	50 U	50
m- and/or p-Cresol	330	50
Hexachloroethane	50 U	50
Nitrobenzene	50 U	50
Hexachloro-1,3-butadiene	50 U	50
2,4,6-Trichlorophenol	50 U	50
2,4,5-Trichlorophenol	130 U	130
2,4-Dinitrotoluene	50 U	50
Hexachlorobenzene	50 U	50
Pentachlorophenol	130 U	130

Surrogate Recovery		QC LIMITS
2-Fluorophenol	43%	21-110%
Phenol-d5	34%	10-110%
2-Chlorophenol-d4	73%	33-110%
Nitrobenzene-d5	86%	35-114%
2-Fluorobiphenyl	96%	43-116%
2,4,6-Tribromophenol	129%E	10-123%
Terphenyl-d14	172%E	Y 33-141%

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

EPA METHOD 8270
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Huntingdon

Client ID:	GS-C6-103	Lab ID (HSN):	GS-C6-103
Matrix:	LEACH	Filename:	4157K20
Date Sampled:	05/27/94	Sample Size:	200 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/05/94	Dil. Factor:	1
Date Analyzed:	06/07/94		
Date Leached:	06/02/94		

Compounds:	ug/L (PPB)	EQL
Pyridine	50 U	50
1,4-Dichlorobenzene	50 U	50
o-Cresol	50 U	50
m- and/or p-Cresol	26 J	50
Hexachloroethane	50 U	50
Nitrobenzene	50 U	50
Hexachloro-1,3-butadiene	50 U	50
2,4,6-Trichlorophenol	50 U	50
2,4,5-Trichlorophenol	130 U	130
2,4-Dinitrotoluene	50 U	50
Hexachlorobenzene	50 U	50
Pentachlorophenol	130 U	130

Surrogate Recovery		QC LIMITS
2-Fluorophenol	41%	21-110%
Phenol-d5	28%	10-110%
2-Chlorophenol-d4	66%	33-110%
Nitrobenzene-d5	77%	35-114%
2-Fluorobiphenyl	72%	43-116%
2,4,6-Tribromophenol	102%	10-123%
Terphenyl-d14	129%	33-141%

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

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EPA METHOD 8270 **Huntingdon**
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID:	GS-B6-104	Lab ID (HSN):	GS-B6-104
Matrix:	LEACH	Filename:	4157K23
Date Sampled:	05/27/94	Sample Size:	200 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/05/94	Dil. Factor:	1
Date Analyzed:	06/07/94		
Date Leached:	06/02/94		

Compounds:	ug/L (PPB)		EQL
Pyridine	50 U		50
1,4-Dichlorobenzene	50 U		50
o-Cresol	14 J	X	50
m- and/or p-Cresol	52	X	50
Hexachloroethane	50 U		50
Nitrobenzene	50 U		50
Hexachloro-1,3-butadiene	50 U		50
2,4,6-Trichlorophenol	50 U		50
2,4,5-Trichlorophenol	46 J		130
2,4-Dinitrotoluene	50 U		50
Hexachlorobenzene	50 U		50
Pentachlorophenol	130 U		130

Surrogate Recovery		QC LIMITS
2-Fluorophenol	0%U	X 21-110%
Phenol-d5	0%U	X 10-110%
2-Chlorophenol-d4	31%	X 33-110%
Nitrobenzene-d5	90%	35-114%
2-Fluorobiphenyl	86%	43-116%
2,4,6-Tribromophenol	71%	10-123%
Terphenyl-d14	180%E	Y 33-141%

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
Y = Associated internal standard failed method criteria
X = Interferences present

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

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EPA METHOD 8270 **Huntingdon**
TCLP SEMIVOLATILE ORGANIC COMPOUND RESULTS

Client ID:	GS-B6-104 DL1	Lab ID (HSN):	GS-B6-104 DL1
Matrix:	LEACH	Filename:	4157K22
Date Sampled:	05/27/94	Sample Size:	200 mL
Date Received:	05/31/94	Extract Vol.:	1000 uL
Date Extracted:	06/05/94	Dil. Factor:	10
Date Analyzed:	06/07/94		
Date Leached:	06/02/94		

Compounds:	ug/L (PPB)	EQL
Pyridine	500 UD	500
1,4-Dichlorobenzene	500 UD	500
o-Cresol	500 UD	500
m- and/or p-Cresol	65 JD	500
Hexachloroethane	500 UD	500
Nitrobenzene	500 UD	500
Hexachloro-1,3-butadiene	500 UD	500
2,4,6-Trichlorophenol	500 UD	500
2,4,5-Trichlorophenol	1300 UD	1300
2,4-Dinitrotoluene	500 UD	500
Hexachlorobenzene	500 UD	500
Pentachlorophenol	1300 UD	1300

Surrogate Recovery		QC LIMITS
2-Fluorophenol	45%JD	21-110%
Phenol-d5	33%JD	10-110%
2-Chlorophenol-d4	77%JD	33-110%
Nitrobenzene-d5	86%JD	35-114%
2-Fluorobiphenyl	81%JD	43-116%
2,4,6-Tribromophenol	99%JD	10-123%
Terphenyl-d14	113%JD	33-141%

TCLP = Toxicity Characteristic Leaching Procedure
EQL = Estimated Quantitation Limit (lower calibration limit)
U = Undetected at the given EQL
J = Detected below the EQL (estimated value)
E = Exceeds the upper calibration limit (estimated value)
B = Also detected in the associated Blank
D = Analysis at a secondary Dilution factor

Reference: "EPA Test Methods for Evaluating Solid Waste", SW-846, November 1986, 3rd Edition.

HPN:

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111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 7, 1994

TO: Steven Skare, Project Manager, E & E, Chicago, IL

FROM: David Hendren, TAT-Chemist, E & E, Chicago, IL DH

THRU: Pat Zwilling, ATATL, E & E, Chicago, IL

SUBJ: **Organic Data Quality Assurance Review** for Pesticides/PCBs for Sauget Area One, Sauget, St. Clair County, Illinois

REF: Analytical TDD:T05-9405-803 Project TDD:T05-9405-006
Analytical PAN:EIL0836AAA Project PAN:EIL0836SAA

The data quality assurance review of 4 soil and 1 water samples collected from the site has been completed. Analyses for Pesticides/PCBs were performed by Twin City Testing Corporation (Huntingdon) of St. Paul, Minnesota in accordance with USEPA SW-846 Method 8080.

The samples were numbered in the field as follows. The corresponding laboratory identification numbers are provided:

TAT Sample # corresponds to - >	Laboratory Sample #
GS-C304-101	25147
GS-C4-102	25150
GS-C6-103	25152
GS-B6-104	25154
GS-D2W-105	25155

Data Qualifications:

I. **Holding Time:** Acceptable

The samples were collected on 5/27/94, extracted for analysis on 6/9/94 and analyzed on 6/13/94. The water sample (GS-D2W-105) was extracted on 6/3/94 and analyzed on 6/10/94.

The holding time criteria of 14 days from collection to extraction (soils) and 7 days (water) was satisfied. Extracts were analyzed within 40 days following extraction.

II. **Instrument Performance:** Acceptable

The laboratory did not report the percent breakdown for DDT and endrin. However the calibration check analysis showed that both were recovered above 100% and significant breakdown could not have occurred.

III. **Calibration:**

A. Initial Calibration: Qualified

A 5-point initial calibration was performed prior to analysis for all analytes. The percent relative standard deviation for endrin was calculated at 12.3%, which exceeded the 10% limit. Therefore, all values for endrin are flagged "J" as estimated.

B. Continuing Calibration: Qualified

The percent difference (%D) between initial and continuing calibration exceeded 15% endrin (126 %) for the soils analyses.

IV. **Method Blank:** Acceptable

A method blank was analyzed for each matrix analyzed. No target analytes or contaminants were detected above the detection limit.

V. **Surrogate Recovery:** Acceptable

Recoveries of the surrogates were exceeded in all soils analyses, resulting from either dilution or matrix interferences. Qualification was not judged to be necessary.

VI. **Matrix Spike/Matrix Spike Duplicate:** Not Applicable

VII. **Confirmation:** Qualified

Confirmation analysis was performed and all identifications were confirmed. Quantitation from the confirmation column analyses failed to be within 25% of the primary column analyses for all reported analytes (for pesticides). Therefore, all positive reported values for pesticides are qualified as estimated and flagged "J".

VIII. **Overall Assessment of Data For Use:**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-01 April, 1990). Based upon the

information provided, the data are acceptable for use, with the above stated qualifications.

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the contract required detection limit or quality control criteria were not met.

Huntingdon

ORGANOCHLORINE PESTICIDE/PCB RESULTS
EPA METHOD 8080

(All values are in μg/Kg which is equal to parts-per-billion)

Client ID: **GS-C3D4-101**

TCT ID: 25147

Compounds:		**PQL**
Aldrin	ND	31,000
alpha-BHC	ND	31,000
beta-BHC	ND	31,000
delta-BHC	ND	31,000
gamma-BHC (Lindane)	ND	31,000
4,4'-DDD	ND	64,000
4,4'-DDE	ND	64,000
4,4'-DDT	ND	64,000
Dieldrin	ND	64,000
alpha-Endosulfan	ND	31,000
beta-Endosulfan	ND	64,000
Endosulfan Sulfate	ND	64,000
Endrin	190,000[2]	64,000
Endrin Aldehyde	ND	64,000
Heptachlor	ND	31,000
Heptachlor Epoxide	ND	31,000
4,4'-Methoxychlor	ND	310,000
Technical Chlordane	ND	640,000
Toxaphene	ND	640,000
PCB 1016	ND	640,000
PCB 1221	ND	640,000
PCB 1232	ND	640,000
PCB 1242	ND	640,000
PCB 1248	ND	640,000
PCB 1254	ND	640,000
PCB 1260	15,000,000[3]	3,200,000
% Surrogate #1 Recovery	---%[1]	
% Surrogate #2 Recovery	---%[1]	
Date Extracted:	6/9/94	
Date Analyzed:	6/13-14/94	

All results are reported on a dry weight basis.
[1]Low surrogate (diluted out)
[2]Reported value is not confirmed within 25% RPD
[3]Chromatographic peaks within pattern of identified PCB
PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-Tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)
Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

Huntingdon

ORGANOCHLORINE PESTICIDE/PCB RESULTS
EPA METHOD 8080

(All values are in μg/Kg which is equal to parts-per-billion)

Client ID: **GS-C4-102**

TCT ID: 25150

Compounds:		**PQL**
Aldrin	ND	270
alpha-BHC	ND	270
beta-BHC	ND	270
delta-BHC	ND	270
gamma-BHC (Lindane)	ND	270
4,4'-DDD	ND	550
4,4'-DDE	ND	550
4,4'-DDT	ND	550
Dieldrin	ND	550
alpha-Endosulfan	ND	270
beta-Endosulfan	ND	550
Endosulfan Sulfate	ND	550
Endrin	6,900[1]	550
Endrin Aldehyde	2,200[1]	550
Heptachlor	ND	270
Heptachlor Epoxide	ND	270
4,4'-Methoxychlor	ND	2,700
Technical Chlordane	ND	5,500
Toxaphene	ND	5,500
PCB 1016	ND	5,500
PCB 1221	ND	5,500
PCB 1232	ND	5,500
PCB 1242	ND	5,500
PCB 1248	ND	5,500
PCB 1254	ND	5,500
PCB 1260	ND	5,500
% Surrogate #1 Recovery	83%	
% Surrogate #2 Recovery	---%[2]	
Date Extracted:	6/9/94	
Date Analyzed:	6/13/94	

All results are reported on a dry weight basis.
[1]Reported value is not confirmed within 25% RPD
[2]Low surrogate recovery (diluted out)
PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-Tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)
Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

Huntingdon

ORGANOCHLORINE PESTICIDE/PCB RESULTS
EPA METHOD 8080

(All values are in µg/Kg which is equal to parts-per-billion)

Client ID: GS-C6-103

TCT ID: 25152

Compounds:		**PQL**
Aldrin	ND	310
alpha-BHC	ND	310
beta-BHC	ND	310
delta-BHC	ND	310
gamma-BHC (Lindane)	ND	310
4,4'-DDD	3,500[1]	630
4,4'-DDE	950[1]	630
4,4'-DDT	ND	630
Dieldrin	ND	630
alpha-Endosulfan	ND	310
beta-Endosulfan	ND	630
Endosulfan Sulfate	ND	630
Endrin	5,800[1]	630
Endrin Aldehyde	ND	630
Heptachlor	500[2]	310
Heptachlor Epoxide	ND	310
4,4'-Methoxychlor	ND	3,100
Technical Chlordane	ND	6,300
Toxaphene	ND	6,300
PCB 1016	ND	6,300
PCB 1221	ND	6,300
PCB 1232	ND	6,300
PCB 1242	ND	6,300
PCB 1248	ND	6,300
PCB 1254	ND	6,300
PCB 1260	400,000[2]	32,000
% Surrogate #1 Recovery	184%[3]	
% Surrogate #2 Recovery	22%	
Date Extracted:	6/9/94	
Date Analyzed:	6/13-14/94	

All results are reported on a dry weight basis.
[1]Reported value is not confirmed within 25% RPD
[2]Chromatographic peaks within pattern of identified PCB
[3]High surrogate recovery possibly due to dilution and matrix effects
PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-Tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)
Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

Huntingdon

ORGANOCHLORINE PESTICIDE/PCB RESULTS
EPA METHOD 8080

(All values are in µg/Kg which is equal to parts-per-billion)

Client ID: **GS-B6-104**

TCT ID: 25154

Compounds:		**PQL**
Aldrin	ND	1,500
alpha-BHC	ND	1,500
beta-BHC	ND	1,500
delta-BHC	ND	1,500
gamma-BHC (Lindane)	ND	1,500
4,4'-DDD	5,400[1]	3,000
4,4'-DDE	ND	3,000
4,4'-DDT	ND	3,000
Dieldrin	ND	3,000
alpha-Endosulfan	ND	1,500
beta-Endosulfan	ND	3,000
Endosulfan Sulfate	ND	3,000
Endrin	3,100[1]	3,000
Endrin Aldehyde	ND	3,000
Heptachlor	ND	1,500
Heptachlor Epoxide	ND	1,500
4,4'-Methoxychlor	ND	15,000
Technical Chlordane	ND	30,000
Toxaphene	ND	30,000
PCB 1016	ND	30,000
PCB 1221	ND	30,000
PCB 1232	ND	30,000
PCB 1242	ND	30,000
PCB 1248	ND	30,000
PCB 1254	ND	30,000
PCB 1260	ND	30,000
% Surrogate #1 Recovery	91%	
% Surrogate #2 Recovery	215%[2]	
Date Extracted:	6/9/94	
Date Analyzed:	6/13/94	

All results are reported on a dry weight basis.
[1]Reported value is not confirmed within 25% RPD
[2]High surrogate recovery possibly due to dilution and matrix effects
PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-Tetrachloro-m-xylene)
Surrogate #2 = DCB (decachlorobiphenyl)
Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

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ORGANOCHLORINE PESTICIDE/PCB RESULTS
EPA METHOD 8080

(All values are in μg/L which is equivalent to parts-per-billion)

Client ID: GS-105

TCT ID: 25155

Compounds:		**PQL**
Aldrin	ND	0.067
alpha-BHC	ND	0.067
beta-BHC	ND	0.067
delta-BHC	ND	0.067
gamma-BHC (Lindane)	ND	0.067
4,4'-DDD	ND	0.13
4,4'-DDE	ND	0.13
4,4'-DDT	ND	0.13
Dieldrin	ND	0.13
alpha-Endosulfan	ND	0.067
beta-Endosulfan	ND	0.13
Endosulfan Sulfate	ND	0.13
Endrin	ND	0.13
Endrin Aldehyde	ND	0.13
Heptachlor	ND	0.067
Heptachlor Epoxide	ND	0.067
4,4'-Methoxychlor	ND	0.67
Technical Chlordane	ND	1.3
Toxaphene	ND	1.3
PCB 1016	ND	1.3
PCB 1221	ND	1.3
PCB 1232	ND	1.3
PCB 1242	ND	1.3
PCB 1248	ND	1.3
PCB 1254	ND	1.3
PCB 1260	ND	1.3
% Surrogate #1 Recovery	34%	
% Surrogate #2 Recovery	68%	
Date Extracted:	6/3/94	
Date Analyzed:	6/10/94	

PQL = Practical Quantitation Limit
ND = Not Detected
Surrogate #1 = TCMX (2,4,5,6-Tetrachloro-m-xylene)
Surrogate #2 = DCB (Decachlorobiphenyl)
Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

M E M O R A N D U M

DATE: July 7, 1994

TO: Steven Skare, Project Manager, E & E, Chicago, IL

FROM: David Hendren, TAT-Chemist, E & E, Chicago, IL DH

THRU: Pat Zwilling, ATATL, E & E, Chicago, IL

SUBJ: **Volatile Organic Data Quality Assurance Review** for Sauget Area One, Sauget, St. Clair County, Illinois

REF: Analytical TDD:T05-9405-803 Project TDD:T05-9405-006
Analytical PAN:EIL0836AAA Project PAN:EIL0836SAA

The data quality assurance review of 1 water sample collected from the site has been completed. Analysis for total Volatile Organics (VOA) was performed by Twin City Testing Corporation (Huntingdon) of St. Paul, Minnesota in accordance with USEPA SW-846 Method 8260.

The sample was numbered in the field as follows. The corresponding laboratory identification number is provided:

TAT Sample # corresponds to - >	Laboratory Sample #
GS-D2W-105	25155

Data Qualifications:

I. **Holding Time:** Acceptable

The sample was collected on 5/27/94 and analyzed on 6/3/94. The holding time criteria of 7 days from collection to analysis was satisfied.

II. **GC/MS Tuning:** Acceptable

GC/MS tuning to meet ion abundance criteria using bromofluorbenzene (BFB) was acceptable.

III. **Calibration:**

A. Initial Calibration: Acceptable

A 5-point initial calibration was performed prior to analysis. All average relative response factors were greater than 0.05. The percent relative standard deviations (%RSD) between response factors were less than 30% for all detected target analytes.

B. Continuing Calibration: Acceptable

The percent difference (%D) between initial and continuing calibration for VOA compounds were within the quality control criteria of less than or equal to 25% for all detected target analytes.

IV. **Method Blank:** Acceptable

A method blank was analyzed for each matrix analyzed. No target analytes or contaminants were detected above the detection limit.

V. **Surrogate Recovery:** Acceptable

All surrogates were recovered within established limits.

VI. **Matrix Spike/Matrix Spike Duplicate:** Not applicable

The recoveries of the MS/MSD were within established quality control limits.

VII. **Internal Standards:** Acceptable

The established quality control criteria for the internal standards area counts of -50% to +100% from the associated calibration standard was achieved.

VIII. **Overall Assessment of Data For Use:**

The overall usefulness of the data is based on the criteria outlined in "Quality Assurance/Quality Control Guidance for Removal Activities" (OSWER 9360.4-01 April, 1990). Based upon the information provided, the data are acceptable for use.

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VOLATILE ORGANIC COMPOUND RESULTS
EPA METHOD 8260/465D LIST

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID: GS-105

TCT ID: 25155

Compounds:		PQL
Dichlorodifluoromethane	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Dichlorofluoromethane	ND	10
Trichlorofluoromethane	ND	10
Ethyl ether	ND	10
1,1-Dichloroethene	ND	10
1,1,2-Trichlorotrifluoroethane	ND	10
Acetone	ND	10
Allyl chloride	ND	10
Methylene chloride	ND	10
trans-1,2-Dichloroethene	ND	10
Methyl tert-butyl ether	ND	10
1,1-Dichloroethane	ND	10
2,2-Dichloropropane	ND	10
cis-1,2-Dichloroethene	ND	10
2-Butanone	ND	10
Tetrahydrofuran	ND	10
Chloroform	ND	10
1,1,1-Trichloroethane	ND	10
Carbon tetrachloride	ND	10
1,1-Dichloropropene	ND	10
Benzene	ND	10
1,2-Dichloroethane	ND	10
Trichloroethene	ND	10
1,2-Dichloropropane	ND	10
Dibromomethane	ND	10
Bromodichloromethane	ND	10
cis-1,3-Dichloropropene	ND	10
4-Methyl-2-pentanone	ND	10
Toluene	ND	10
trans-1,3-Dichloropropene	ND	10
1,1,2-Trichloroethane	ND	10
Tetrachloroethene	ND	10
1,3-Dichloropropane	ND	10
Dibromochloromethane	ND	10

(continued)

PQL = Practical Quantitation Limit
ND = Not Detected

VOLATILE ORGANIC COMPOUND RESULTS (CONTINUED)
EPA METHOD 8260/465D LIST

(All values are in µg/L which is equivalent to parts-per-billion)

Client ID:	**GS-105**	
TCT ID:	25155	
Compounds:		**PQL**
1,2-Dibromoethane	ND	10
Chlorobenzene	ND	10
1,1,1,2-Tetrachloroethane	ND	10
Ethylbenzene	ND	10
m-/p-Xylene	ND	10
o-Xylene	ND	10
Styrene	ND	10
Bromoform	ND	10
Isopropylbenzene	ND	10
Bromobenzene	ND	10
1,1,2,2-Tetrachloroethane	ND	10
1,2,3-Trichloropropane	ND	10
Propylbenzene	ND	10
2-Chlorotoluene	ND	10
1,3,5-Trimethylbenzene	ND	10
4-Chlorotoluene	ND	10
tert-Butylbenzene	ND	10
1,2,4-Trimethylbenzene	ND	10
sec-Butylbenzene	ND	10
1,3-Dichlorobenzene	ND	10
p-Isopropyltoluene	ND	10
1,4-Dichlorobenzene	ND	10
n-Butylbenzene	ND	10
1,2-Dichlorobenzene	ND	10
1,2-Dibromo-3-chloropropane	ND	10
1,2,4-Trichlorobenzene	ND	10
Hexachlorobutadiene	ND	10
Napthalene	ND	10
1,2,3-Trichlorobenzene	ND	10
Bromochloromethane	ND	10
Surrogate Recovery:		
1,2-Dichloroethane-d4	101%	
Toluene-d8	102%	
4-Bromofluorobenzene	119%[1]	
Date Analyzed:	6/3/94	

PQL = Practical Quantitation Limit
ND = Not Detected
[1]Surrogate recovery above acceptable limit
Reference: EPA Test Methods for Evaluating Solid Waste, SW-846, November 1986, 3rd Edition.

LABORATORY NO: 4416-94-5037

C

ATTACHMENT C - COST PROJECTION

Initial Cost Projection Scenario: SAUGET AREA 1/SITE G

Projection ID Number: IL0836SA Date: 07/22/94
Cleanup Contractor: RES5 - Riedel Environmental TAT Contractor: E & E

Cost Projection Summary

Contractor Personnel	402,925.72
Contractor Equipment	85,825.60
Unit Rate Materials	441,178.10
At Cost Materials	30,670.75
Subcontractors	259,996.00
Waste Transportation	0.00
Waste Disposal	6,270.00
Cleanup Contractor Subtotal	1,226,866.17
Federal and State Agencies	0.00
Extramural Subtotal	1,226,866.17
20 % Extramural Contingency	245,373.23
Extramural Subtotal	1,472,239.40
TAT Personnel	65,540.00
TAT Special Projects	0.00
TAT Analytical Services	0.00
Total TAT Costs	65,540.00
Other Cost Items	0.00
Extramural Subtotal	1,537,779.40
15 % Project Contingency	230,666.91
Total Extramural Cost	1,768,446.31
EPA Regional Personnel	27,225.00
EPA Non-Regional Personnel	0.00
EPA Headquarters Direct (10 % of Regional Hours)	2,160.00
EPA Indirect	38,160.00
EPA Total	67,545.00
Project Total	1,835,991.31

Projection ID Number: IL0836SA Date: 07/22/94
Cleanup Contractor: RES5 - Riedel Environmental TAT Contractor: E & E

Project Scope

Number	Step/Milestone	Estimated Duration	Cost
000	GENERAL SITE COSTS	30 Days	1,835,991.31
			1,835,991.31

ATTACHMENT C

Portions of this attachment were redacted which contain confidential contractor information.